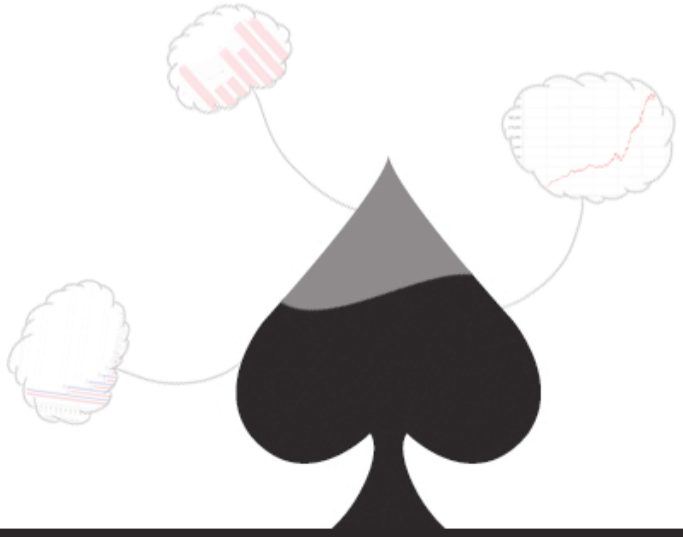

# THE MERSENNEARY E-BOOK

## PRESENTED BY: HUSNG.COM

# ACKNOWLEDGEMENTS

To the reader,

I want to give a very prominent nod to ChicagoRy at HUSNG.com, who made this possible and has always been phenomenal to work with. Maxv2 did the graphics for this and was very kind in indulging all of my minor whims, which is no small task.

Thanks to those both inside and outside of poker who have done so much for me and the way I think about the world. If I've done my job you know who you are.

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# Chapter 1: Foundations

## *How to Think About Expectation in Poker*

*In HUSNGs and all forms of poker, maximizing your results comes from making your decisions based on what will produce the best outcomes over time. Maintaining a consistent focus on expected value goes a long way in helping you be as successful as you can be in the game.*

However, I don't necessarily mean this in the way a lot of people do. Expectation calculations are often seen as a nerd's domain, which sets up a false dichotomy between the math player, who seeks edge by pouring over frequencies and obsessing over calculations, and the feel player, who seeks edge through intuitive understandings of the flow of the game and his or her own natural expertise. While those types of people certainly exist, there are plenty of "math players" who are spectacularly bad at calculating expectation, and plenty of "feel players" who do it exceptionally well. Poker comes down to how well you interact with the math of the game, no matter what kind of player you see yourself as. The decisions you make have an expected value, and you always want to make the ones that will work out best over time.

Given that framework for looking at calculation, it is clear the nerds of the poker world do not have a monopoly on good analysis of expectation. Whatever your skillset, you benefit from thinking about your EV. This ebook aims to give you a framework to do that more effectively.

Let's start by talking about what good poker thinking means. Good poker thinking defines "+EV" as the best possible option, not just better than folding or better than not playing the game at all. It means not just being satisfied with having an edge, but seeking the largest edge possible. It does not want to stick to all of the strategies that have have combined to create a positive winrate in the past – it is always evolving, always questioning, always getting better. It is not afraid of being wrong, but rather staying wrong.

*"Good poker thinking cares about what you should spend your time on."*

The most effective poker minds get rid of notions like "this is just my strategy" and "I've done this for a while and I'm a winning player, so I'm going to keep doing it". They realize that playing different opponents calls for dramatically different approaches, and that it's OK to play against a random player named "DogLoverAA" with a style that Phil Ivey would obliterate, as long as it makes the most money in that game.

Good poker thinking cares about what you should spend your time on. It fears self-indulgent analysis that makes you feel good without actually increasing your long term expectation. It knows which questions are worth asking and which ones distract from meaningful development of your game. It evaluates what you want out of your poker career in the long run, and thinks intently about poker's place in your broader life.

One of the HUSNG.com videos I have received the most positive feedback about is a video that describes two poker players you do not want to become. They are essentially the worst of what the stereotypical "math player" and "feel player" has to offer, and I call them the poker dweeb and the poker bro. The poker dweeb becomes obsessed with the details of the game but does a very poor job of turning that analysis into any additional success. The poker bro develops a swagger about not becoming one of those nerds, but falls victim to misguided notions that lack evidence, causing him to get exposed over time. Focusing on a holistic understanding of expectation helps keep you from becoming either of those people, and it is worth identifying which of the two you are most at risk of turning into.

As you read through this ebook, look for opportunities to make improvements about the way you approach poker. Compare everything you read against your own strategies and methods of looking at the game. Think about which differences in approach are stylistic, which ones I might be wrong about, and most importantly, which ones describe opportunities to change something that you currently do that you could be doing much more effectively. It will do you little good to nod along passively, simply thinking everything I am saying sounds reasonable – to make something substantial out of your time, you have to think about how the ebook might be indicating specific things you currently do suboptimally. That goes for whether the information is about readless ranges from the small blind 12bb deep, playing against the tendencies of tough regs, or making poker a productive part of your broader life. It all goes back to learning how to maximize your expectation.

# Studying that Helps, and Studying that Wastes Your Time

All talk of bros and dweebs aside - if you are reading this, I can fairly safely assume that you like learning about poker theory. You probably don't mind someone else telling you how you might adjust your game to increase your profits. The terms "polarized", "perceived range", and "population tendencies" don't send you running for the hills screaming about what the nerds have done to an ideally pure and intuitive game. You're motivated to get better, and you're willing to put in the work to get to the top, where you can see the most successful high stakes players grinding out such pretty graphs.

All of this is good – very good, in fact. Most of the time, having that kind of determination and willingness to work hard will serve your interests. As much as it can be tempting to look at the best players in the game and only think of them as prodigies with exceptional natural talent (although this also can be true), there are players with just a little less god-given skill who work their asses off to knock the current legends off their perch. Sometimes they succeed and we stop thinking of former top players so highly, sometimes they don't, and you get someone like Olivier "livb112" Busquet, who has been at the top of the HUSNG world for many years now. Those results do not just come from talent, but also a continuous drive to be the best and an understanding that staying on top of the game means working at it.

OK, you get it, hard work is important. But that's not what this article is about. You already knew that hard work is important already; that's why you're reading this instead of all the other things you could be doing with your time right now. Instead, the point of this article is to warn you about one of the biggest problems people who like to read poker theory often have: Thinking they are becoming a better poker player by studying, but actually are working ineffectively and not improving at all.

Sklansky-Chubukov is a great example of where people run into trouble. It seems like a concept for advanced players – An endgame chart like the one derived from a Nash Equlibrium, except more obscure. This one tells you how to play against your opponent if he has a perfect calling range against your hand (we'll go into this more in the extensions section of the ebook). This comes across as pretty cool, and like it might be some tool you could use to get an edge on very good players, or maybe something they're already using to exploit you. However, as it turns out, basically the entire exercise is useless. An opponent who can see your cards is so far removed from the experience of real poker that the charts give very little useful information to good players. In fact, my guess would be that most students who come to me with questions about Chubukov would be better off having never heard of it, and that attempting to learn it has actually lost them money, with no significant payoff if they would have understood it correctly.

That makes for only one small example. I could list many more individual instances of this happening, but I do not want you to miss the big picture by looking at each one on its own and saying "well, I don't do that, so mersenneary isn't talking to me". That's because I can pretty much guarantee you that you do something in this general category. Almost everybody who spends time studying poker also spends time studying the game in a way that will not help them earn extra money at all, while at the same time believing the opposite.

It is a bit of a crude term, but I've always thought of this as "masturbatory learning". It can often come out of a desire to say the following things:

*I'm great. I work hard. I know advanced poker concepts. I deserve better results. I know the theory of the game better than other people do. The more complicated things get, the better I am. I can talk about the details of a situation in exquisite detail, using all of the poker terms people use. I can find the answer to any poker question. I can make myself come across well on an internet poker forum, or when talking about poker with my friends. I'm learning and I'm getting better – I deserve success.*

To be clear, there are plenty of other harmless reasons as well – maybe you know that a certain type of studying is not going to help you win more money, but you just like solving poker puzzles and developing your poker mind, even if a specific question is not actually going to have much of an effect on your results. And that's perfectly fine. I am not trying to tell anybody to not do something they enjoy doing.

All I am saying is that you need to be very careful with assumptions that what you are doing will help you make more money. I always tried to make sure that when I ran statistical analysis or asked a question about a concept, there was a very clear reason for why I was investing the time into doing it, and if I was doing it to become a better poker player, it was because there were very clear implications about practical adjustments I could make depending on what I learned. In academia, you often get scrutinized on the following question when requesting funding for your research: How could your potential findings lead to meaningful changes in your field? Similarly, when thinking about the game from a professional mindset, if the question you are asking does not imply a way to make money from the answer, be careful about whether to use your time asking it.

When I solved for whether to jam A4o over a minraise first hand in a superturbo, either readless or against someone with a certain opening percentage, it was because I knew I could use that information very directly to obtain better results. When I solved for the expectation of openjamming certain hands 12bb deep given certain assumptions, it was to compare that expectation against my results limping or minraising and come to a determination of what would make me more money going forward given how often those spots come up. When I queried my database to see my results raising small pairs out of position 35bb deep or more, it was to see if I could make more money by checking behind. When I started worrying I was playing too many hands out of position, and queried my database to find out, it was because I knew that the results had a high probability of improving my results going forward. That's what happened. After a period of time spent learning about poker, you should be able to identify what you learned on that day and specific instances of what you'll do differently in the future in common situations.

Lots of poker questions can be good to answer for fun, and it does help develop your poker mind. But for the most part, professionally, your goal should not just be to learn an answer you don't know. Your goal should be to learn what to do with the answer going forward. If you can't answer that, maybe that's the poker puzzle you should start with.

# Meaningful and Meaningless Errors

*You are heads up on the button, 30 big blinds deep, and you raise with AA. Your opponent calls, and you see a K63 flop, no flush draw possible. You continuation bet and get called. The turn is a 9 – still no potential flush draw. Again, your opponent check/calls. The river is a queen, and to your surprise, your opponent moves all-in.*

Suddenly, a pair of aces shrinks up in your head. There are only a couple of possible missed draws, and your opponent could easily have been trapping with two pair or a set. Could he have somehow called the flop with JT? Could he ever take this line with just a pair of kings? You hit the timebank, thinking about other aspects of the hand – just how often you need to be good given the size of the bet, and everything you've seen from your opponent so far. Finally, you decide to click the call button. Your opponent shows up with Q9, and instantly declines the rematch.

Memories of hands like this will keep a poker player up at night. Were you supposed to find a fold? It will of course depend on the aforementioned (unmentioned) details, but in general, this situation seems pretty close to me. There are few coherent hands for our opponent to take this line with, either for value or for bluff. You will see some traps, some missed straight draws, and some hands that are played completely nonsensically (some of those you beat, some of those you don't). But it is a rather rare situation – you will not see it come up very often. It is also a fairly tough question – it is difficult to get at a very precise approximation of what your opponent's range is, and our best guess makes calling and folding fairly close in expectation.


To some people, this makes for a very important and meaningful poker question to ask for help about. The decision was agonizing. It turns out that our opponent had a better hand. We had no idea what to do, and the situation seems novel and interesting. From this perspective, it might seem like a good idea to invest a lot of time into thinking about whether or not calling was an error.

*"More meaningful errors often come from less interesting situations."*

However, the fact that this situation was rare, and the decision was close, actually means the exact opposite: What we decide about this spot will have close to no impact on our winnings going forward. Getting an answer about whether most of your good friends think it is "close, but probably a call" or "close, but probably a fold" may help you close the computer and get to sleep, but it won't actually help you make more money in the future.

One of the most influential pieces of poker strategy I picked up in my career was written by Ed Miller, and was actually about full ring limit hold 'em. In a thread on the twoplustwo forums, he pointed out that how meaningful your mistakes are is a function of the frequency of how often you get into that situation, and the magnitude of how much reduced your expectation is when making a suboptimal play. Multiplied together, those tell you how significant your mistake was. Therefore, the more rare the situation and the closer the decision, the less you should careabout the answer of what action you should have taken.

Of course, this does oversimplify things a bit. From talking about this hand, we do learn more about generic bluffcatching decisions. We can learn that folding here if a flush draw were present on the flop is much more often going to be a significant error, and talk about what that implies about the importance of board texture in all sorts of different situations. Plus, it is often simply more fun to talk about decisions that are rare, and being able to enjoy talking about poker theory is valuable, too. However, people very often get caught up needing to know "the answer", and the answer here is essentially meaningless. Dwelling on it is an example of what we talked about in the last article: Studying that feels good, but won't actually have any impact on your winrate.

More meaningful errors often come from less interesting situations. Folding to a minraise with 97o without any significant reads that your opponent is opening a tight range will only lose you a fraction of a big blind in expectation every time you do it. However, because that situation happens over and over again, especially considering all of the similar hands that we may also be erroneously folding, it makes for a very meaningful mistake. In fact, a later article will talk about my recommended out of position playing range, and show data that suggests a more conservative (but not crazily so) range would have cost me around $60,000 over my poker career. Because these decisions happen so frequently, they add up dramatically over time.

Despite this, these decisions are also the ones that people often want to talk about the least. It may be because talking about these fundamentals of opening and calling ranges, whether or not to continuation bet, and the extent of which you should adapt various basic frequencies to your opponent's tendencies are generally not the sort of choices that people feel cool about spending time thinking about. Sometimes it is also because people are only comfortable having some aspects of their play criticized, like the unusual, complex decisions, and find it very uncomfortable when told that they are getting a much simpler decision incorrect. Often this is accompanied with some rationale about "style" – how they just prefer to check back some hands and use a small-ball approach, or not get into too many marginal spots out of position. These statements tend to boil down to the position of "even if I am wrong and some other play has better expectation, I am still right because I play a different style and I win with it". This type of argument is almost always unconvincing, especially because it is a way of saying "either I'm right, or I'm right". Instead of going this route, you should embrace the chance to discover changes that can lead you to make significantly more money.

Because of this reality, we will talk a lot about basic decisions in this ebook – the fundamental frequencies and adjustments to be making day in and day out in common situations against different opponents. These articles will also showcase the true complexity of these types of choices, and demonstrate how advanced analysis can be a significant help in making better decisions, not just in theoretical exercises. As we go, think about the questions we have talked about so far – what are you learning that is going to change the way you approach actual situations in-game? How significant are your errors, in terms of the frequency and the magnitude that they occur? Keeping your attention on these questions will lead to the most meaningful gains.

# Game Theory Optimal and Exploitative Play

*Most students of HUSNGs are at least aware of the Nash Equilibrium charts for endgame play, which solves shortstacked strategy if the small blind is only allowed to go all-in or fold preflop. In equilibrium, neither opponent has any incentive to change their strategy – any adjustment will have worse expectation. Thus, perfect poker players would actually play the endgame the same way for eternity against each other.*

What fewer people know is that Nash Equilibrium as a concept is not just limited to shove-or-fold endgame play. At any stack depth, there is a complex Nash Equilibrium that says what perfect poker players would do against each other to break even with each unable to profitably deviate. John Nash's work proving this (heads up poker is a game that falls into conditions he set proving it about various games) helped him earn a Nobel Prize. However, don't feel bad if you were unaware about this aspect of Nash Equilibrium – Tom "durrrr" Dwan recently argued with a great deal of conviction that this conclusion is false. If Dwan can prove it, he will likely become the first professional poker player to become a Nobel Laureate.

The takeaway knowledge here is that it is possible to play a static, mixed strategy, and for no opponent to be able to profit against you. In fact, opponents will always have negative expectation against you unless they too are playing Game Theory Optimally (GTO). It can be very worthwhile thinking about what this solution might look like, especially because every non-GTO strategy is one that is readily available to be exploited.

While the entire GTO strategy is very difficult to compute, you can learn more about it by working through balanced ranges in common situations. Because of the power of position, the GTO small blind strategy is likely very aggressive, putting constant pressure on the big blind and making as many bluffs as possible without becoming unbalanced. This tells you that when you play against a tough opponent, you have to be very careful about getting exploited by having ranges that are too value-oriented from the small blind. Likewise, when you check/raise the flop and bet the turn and river, it seems reasonable that in equilibrium you would include as many bluffs as you can get away with given all the value hands in your range.

It can be very tempting for poker players, upon knowing that it is possible to be unexploitable with balanced frequencies, to stick to strategies that seem like they might be close to GTO. The allure of it being impossible for your opponent to beat you can be very strong. However, every time you try to be unexploitable, you pass up on an opportunity to maximally exploit your opponent's frequencies, and GTO strategies are really made to play against other GTO strategies. If your goal is to make as much money as possible in your games (and I'm assuming it is), seeking to be unexploitable is not really a coherent approach – for the most part, playing GTO guarantees that you'll be throwing away boatloads of expectation. Again, you are playing DogLoverAA, not Phil Ivey. Be wary of biases that can lead you to play fancier, prettier poker, instead of poker that makes the most money.

Of course, it is not so easy as to just "decide to play GTO", anyway. Nobody really has that much of a sense of what GTO poker 75bb deep would even look like, so saying, "OK, I'll decide to play perfect poker now" is not really an option. Because of this, the vast majority of specific advice in this ebook will be exploitative advice, taking advantage of the general exploitable tendencies of opponents and the ways you can make the most from players with other styles. This means that a lot of the strategies I advocate for are exploitable - that's not something to be afraid of. Since your opponents are not playing GTO, what makes the most money will absolutely be exploitable. You will have to adapt if your opponent adjusts. Still, after tens of thousands of games, I am consistently reminded of just infrequently opponents optimally adjust against exploitative frequencies.

Well-reasoned, exploitative play is also exploitable play. Embrace this reality. From the start off the match, go after frequencies that you think you can exploit. Learning about the game theory of poker will help you in adjusting your tendencies against different opponents, but beware the fancy play syndrome that results from putting more emphasis on being balanced than on making money.

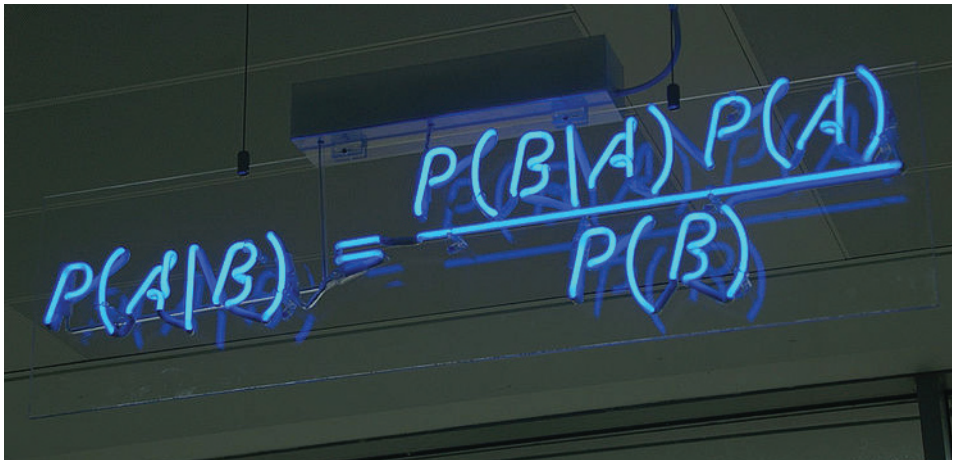
# Bayesian Inferences and Developing Information

As a poker coach, I frequently get asked questions with potential answers that lie on a continuum, from people who want a binary response. How big of a sample size of games do I need to have before I am sure that I am a winner? How many hands does my opponent need to open before I should start adjusting against it? When should I start to assume my opponent likes to 3-bet bluff, rather than just getting a string of good hands? In truth, after the very first time you win a HUSNG, see your opponent open a button, or get 3-bet, you already have information that you should be working into your best guess of those frequencies.

To be clear, I think it is important to not be a nit about terminology, and that doing so can lead to some errors. Here's an example: In psychology literature, there is a somewhat famous study about how "illogical" people can be. The study describes a woman named Linda, who "is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations." The experiment then asks which is more probable:

*A) Linda is a bank teller.*
*B) Linda is a bank teller and is active in the feminist movement.*

Despite the fact that if Linda is a bank teller who is active in the feminist movement, she must also be a bank teller (which makes A clearly more likely) 85% of respondents chose B. This is often cited as a robust example of how illogical people can be and the massive cognitive errors our brains have, but I completely disagree with that interpretation. In my view, people (consciously or otherwise) decided to interpret the question as different than the literal meaning, given that this question is rarely asked with that response in mind in the real world. Typically, a question like this would be asked far more often as a way of trying to get a better holistic sense of Linda, willing to give up some accuracy for a more complete description. Additionally, when presented with these choices, many people will figure that it is quite possible that letter A is meant to indicate "Linda is a bank teller and not active in the feminist movement". Thus, many respondents are actually employing fantastic Bayesian thinking by deciding to give what is likely to be the most relevant answer to the question that is most likely being asked. As a reward, subjects are chided for their errors in Psychological Review. Seems harsh to me.




Similarly, when players ask how big of a sample size they need to be sure they are a winner, we should give them a little more credit and assume they are asking around how big of a sample size do they need to be reasonably sure they are a winner. If you are a logic and numbers nerd like I am, always make sure you give people enough credit for what they mean to say rather than taking every word literally.

To introduce the concept of a Bayesian Inference, I would like to take you to Chicago for an interview with the finance company I work for. My preference is toward simple, easily accessible problems, and here's one I might ask you to test your ability to think probabilistically:

*You leave your apartment groggily one morning, closing the door behind you. Suddenly, you are hit by a terrifying question: Do you have your keys, or are you now locked out? You stand there thinking about it for a few seconds, before deciding that yes, you probably have your keys, further estimating that 80% of the time, you have them. You also decide that there is an equal chance of your keys either being in your left pocket or your right pocket, and if they aren't in either pocket then you don't have them at all. Slowly, perversely enjoying the sweat, you slide your hand into your right pocket, and find that your keys are not there. What should you now think is the probability that your keys are in your left pocket?*

If the answer does not seem clear to you, don't feel bad – the answer was not immediately clear to many of my co-workers, either. On one hand, it seems like the answer should be 40% - you checked one out of the two pockets, and now half your chance is gone. Maybe it should still be 80% - you thought that this was the probability before, and you're not done checking, so the probability doesn't go down until you've actually completely looked. Or maybe it should be somewhere in the middle – but if so, how would we come up with a number?

This situation is analogous to a lot of poker thinking. When your opponent raises his first three buttons when he gets down to 10-14bb deep, you have to decide – is he really that aggressive, or did he just get two or three inducing hands in quick succession? When your opponent 3-bets two out of your first four button opens, do we have reads now that our opponent likes to 3-bet with a wide range? The basic gist of the answer to these questions, and the keys question, is that we have to learn to think about the potential worlds we could be in and how those change over time. It is now more likely that we do not have the keys than before, but we very easily could be in the world where we have them. It is now more likely that our opponent likes to raise a high percentage of hands (or 3-bet a high frequency), but we cannot be sure. To do the best overall given all of the situations we could potentially be in, we have to learn to appropriately weight new information with what we knew before.

For the keys example, one easy way to think of it is that there are five possible worlds we could be in after closing the door, with us having the keys 80% of the time and there being an equal chance of them being in each pocket. In two worlds, the keys are in the left pocket, in two more, they are in the right pocket, and in one oh so cruel world, the keys are sitting on your desk inside. Once we check the right pocket and find no keys, there are only three possible worlds we can be in: The two where we will happily find them in the left pocket, and the one that will cause us to bang our head against the wall. From this, we learn that the best approximation is now a 2/3 chance that we have the keys and with a bit of relief we can go on with our day.

This type of probabilistic reasoning is called a Bayesian Inference, which is a fancy way of saying we are using Bayes' Rule, which is a fancy way of saying we're taking into account all the possible worlds we could be in given new evidence (both concepts are worth looking up on wikipedia, for those interested). In poker, you start with a general sense of what people do on average, and then face an opponent who has tendencies that are somewhere in that vast distribution. The very first hand you play gives you information, but just because your opponent raised preflop and continuation bet does not mean your opponent frequently raises and continuation bets – it is just now slightly more likely. Your optimal strategy readless will be to play against what your general opponent pool does on average, and then make increasing adjustments as you get more and more data about tendencies that are different than the norm. Some of those tendencies you can learn more quickly about: If your opponent quickly folds when presented three straight opportunities to check/raise bluff on a dry board, we already know that our opponent is significantly less likely to check/raise a wide range, and it becomes a significant error to check behind with hands that might be borderline otherwise.

As you play against new opponents, consciously think about that process of obtaining new information and hedging it against what you know about what most players do. Realize that as your sample size increases, so do your adjustments to unusual frequencies, but that there is no single point where it starts to be correct to make a drastic adjustment, as you should be making those over time as you get more and more information. Especially considering it is impossible to know for sure what your opponent is doing, optimal poker embraces the uncertainty, tries to make the guess that will have the best expectation on average, and constantly updates that guess when given new information.

## ABC Heads Up Poker - Setting Up A Good Default Strategy to Win From the First Hand

*"Just play ABC and you'll be fine"* is a common response to people who ask how to play against poor players. However, that expression is pretty empty if we all have different ideas of what "ABC" actually means. Some people say it to mean "just bet when you have it, and check when you don't", others mean it as quite the opposite, focusing on being balanced until you learn what your opponent's strategy is. My definition of ABC is a little different: Optimal strategy against the aggregate tendencies of your population of opponents. In a little less wordy language, that means doing what's best against the average opponent. Sometimes this means being balanced, sometimes this means being heavily weighted towards value or bluff, all because the basic math of readless situations tells us it is generally going to be profitable to take an action against a random opponent.

Let's get a little specific. Here are some common tendencies of random opponents, especially at lower stakes:

***a) Overplays value hands.***
***b) Plays fairly fit-or-fold on the flop OOP.***
***c) Tries to see too many flops.***
***d) Makes transparent betsizings (more = better hand).***
***e) Not aggressive enough in limped pots OOP***
***f) Does not do too much critical thinking about your betsizing.***
***g) Employs a default strategy and does not often adjust.***

Along with lots of other traits. This is not to say that every random opponent we play against will call too many 3bets, in fact, our opponent may turn out to be very tight when facing re-raises. Adjusting accordingly after noticing that is very important. However, it is also crucial to start out by taking advantage of typical flaws fish have, even before you have a more conclusive sense of your opponent's tendencies. Here are some ways we do that:

### *Default button raising strategy*

Because our opponent is likely trying to see too many flops OOP and is too stubborn once he hits a hand, I think raising 100% of hands against a fish is an error. The junkiest hands should be folded without further reads. However, the fact that our opponent likely plays fairly fit-or-fold on the flop and calls with some poor holdings preflop means that raising and making a half-pot continuation bet is often best with a wide range of hands. The fact that people play poorly in limped pots OOP means that we can also develop a limping range with middling hands that play well in limped pots, like T8o, although it is certainly debatable whether limping is worth it at all without additional reads.

### *Default c-betting strategy*

Continuation bet when you miss the flop, but your opponent will also likely have missed. ABC poker means following up with a continuation bet with 64ss on a A72r flop – we get folds too much of the time not to bet, even against a loose player. However, that same 64ss is likely not going to be a good c-bet on a JT9ddd flop – too many of our opponent's hands will call our bet, and it is best to give up.

*Default 3-betting strategy*

Because most opponents try to see too many flops, I think 3-bet bluffing readless against a random player is generally going to be an error, with some exceptions (see the article on when to 3-bet bluff for more information on when to do that). In general, our 3-betting range should be weighted towards value hands. It's important to notice, though, that if our opponent is calling wide, that doesn't mean our 3betting range should be too tight – that trait enhances our expectation from 3betting a hand like KJo.

These tendencies and appropriate adjustments will be completely different once we know things about our opponent. Against a garden variety $100 reg speed nit, for example, it's correct to 3-bet a very wide range with lots of bluff hands in response to their tendency of raising wide and being too tight against re-raises..

The biggest mistake people make is seeing our ABC starting point as a final strategy, with few adjustments needed. In reality, in the vast majority of games against random opponents, if you find yourself employing the same strategy at the start of the match as you are at the end of the match, you're doing it wrong. An ABC strategy should be what is optimal without reads, but after some hands, you should focus on figuring out how to exploit your opponent, not the generic opponent. Adjusting and optimizing based on your opponent's frequencies is the way to maximize your success.

I call the next two sections "frequencies" and "extensions", and they form a more detailed, rigorous examination of specific situations in heads up sit and go poker. This foundations section gives you a base for how to approach the rest of the ebook. Stay focused on expectation. Realize what errors are significant and which waste your time. Think about how we process new information and what the exploitative starting point looks like for the random opponent in your games. If those fundamentals of broader poker thinking are developed, it makes thinking about the specifics of the game significantly easier and more rewarding.

# Chapter 2: Frequencies

## *How and when to 3-bet light*

*One leak that consistently comes up in my one-on-one coaching is light 3-bets with the wrong sorts of hands in the wrong sorts of situations. 3-betting a wide range is a powerful tool to have at your disposal, especially if you like playing against conservative opponents. However, it can get you into a decent amount of trouble if you ignore the fundamentals of what makes the play good or bad, so you need to make sure you understand when and how to step up the aggression out of position.*

Situational awareness can be one of the first things to go for a good player trying to put in volume to get out of a rough patch. They see J4s 40bb deep facing a minraise, and know that this is a good hand to make a light 3-bet with in general and they do it. Optimal poker requires more analysis than that. When you make a 3-bet bluff because you know it is sometimes good, without going through and figuring out if it is actually good in this particular situation, you throw away money. Similarly, when you fail to make a 3-bet bluff because you know it is sometimes good to play tight out of position, without figuring out if this is actually one of those situations, you throw away money. Try to avoid justifying these decisions by saying things like "it's just my strategy to be [aggressive/conservative] from the big blind". While there is certainly room for different stylistic approaches to exploiting your opponent in poker, this type of static thinking tends to lead to less exploitation of your opponent's frequencies, not more.

The expectation from 3-betting light comes down to four main factors, in order of importance:

1. *Your opponent's opening range.*
2. *How loose and aggressive your opponent is, both preflop and postflop.*
3. *The properties of the specific hand you've been dealt.*
4. *Your perceived 3-betting range and your opponent's willingness to adapt.*

Very often, when I ask a student, "why did you 3-bet there?", I'll get back an answer that has nothing to do with some or even a single one of these factors. Let's talk about why they matter and how to think about them.

Opening range, the most important factor, has some amount of calculation involved in it in order to make optimal 3-betting decisions, but you can get most of the benefits by just having a good, general sense of the effect. If all other frequencies are the same, it is much better to 3-bet an opponent who is opening 80%, than an opponent who is opening 40%. All those extra air hands make a dramatic difference in the expectation of 3-betting wide. If your opponent is opening close to 100%, and you do not expand your 3-betting range, you will get run over. If your opponent is playing really loosely and aggressively against 3-bets, that just means you need to be expanding your value 3-betting range. If you have a set-in-stone philosophy like "KTo is a hand for calling out of position, not 3-betting", then you lose out on a ton of extra expectation.

The practical truth is that reacting to opening range really comes down to discipline, one of the least sexy aspects of poker. You have to be paying attention to your opponent's opening range to know whether a light 3-bet is good. It doesn't matter if your opponent seems tight against aggression and you've been pushing him around all match – if he's one of those weak players who likes to limp 60% of his holdings and raise his top 25%, 3-betting with J4s when he raises is going to be a terrible play.

Paying attention to this sort of thing isn't sexy, but you know what is? Lots and lots of money. So keep your discipline. Recognize when you have lost it and fight to get the focus back as quickly as possible.

Your opponent's level of looseness and aggressiveness, the second factor on the list, is why 3-bet bluffing is often not such a great idea against most fish – recreational players tend to want to see too many flops, and be too loose when they get to the flop (although you are benefited by the fact that fish can often be much less aggressive). Thus, even if your opponent is opening a wide range, it does not necessarily mean a wide 3-bet bluffing range is optimal. Loose and aggressive play, both preflop and postflop, can mean the main adjustment is to expand your 3-betting range to include more value hands. One of the main benefits to 3-bet bluffing is the ability to pick up the pot on dry boards. If your opponent is the type to float and call down with any pair, that T3s needs to hit the muck preflop rather than be 3-bet, and your 3-betting game becomes all Valuetown.

Let's stop quickly to make an important point: Opens a wide range, plays fairly tight and fit-or-fold against aggression, and wants to get his money in good. What does this sound like to you? To me, this sounds a ton like your garden variety $30-$200 conservative reg who sees poker as a steady, low-risk money-making enterprise. These players have learned to open a high percentage and continuation bet frequently, but still have the terrible affliction of always needing to have the goods in big pots, rather than actually gamble and make creative plays. That's why 3-betting light absolutely needs to be in your arsenal against nitty regulars – it's a strategy built specifically for destroying them.

As for which hands to 3-bet light, there are different schools of thought here and you can build some ranges that make a lot of sense in a few different ways. However, the big point I'll make is that when you 3-bet, it should be because you think 3-betting is better than all other options. In the case of T8s, you should believe that 3-betting has better expectation than calling the raise, a very attractive option with that hand. When you have T3s, you only need 3-betting to have better equity than folding, because that's probably what you'll do if you don't 3-bet. That's why in general, stronger suited connectors work better in your flatting range in HUSNGs. The deeper effective stacks get, the more benefit you get from the implied odds of those hands against the increased strength of your opponent's range, which is why they become more standard hands for light 3-betting in HU Cash.

It is also worth thinking about your opponent's likely flatting range, and what your perceived range is when you 3-bet. Most villains will have flatting ranges of mostly middling cards, and will perceive your 3-betting range to have a lot of Ax and Kx in it (which it does). That's why I'm really not a fan of adding a hand like A3o to your light 3-betting range in most situations. First of all, it has pretty good expectation calling a minraise, so there is a reasonably high standard that 3-betting has to beat. Secondly, pretty much all of his calling range is going to have good equity against us and play well against us postflop. The ace is such an overt part of our range that we'll find it hard to get much value, and when we get outflopped, we often have very little equity. If you do 3-bet with weak Ax hands, it should be because your opponent has very strong tendencies of folding to 3-bets after opening a wide range. Often a small 3-bet and a small c-bet can be used against these opponents to accomplish what you want to accomplish without running too hard into the negatives of playing Ax this way.

Hands like J4s can work much better in your 3-bet-bluffing range because you get credit on all the ace-high and king-high flops, you can flop good equity on some more middling flops, and your expectation from just calling preflop is often mediocre. When you 3-bet light for value, it's best to do it with hands like KT/QJ/QTs, because those hands dominate a lot of the calling range and play much better on a greater variety of flops, not a hand like A7o.

The last item on the list is essentially all about gameflow. Gameflow is by far the sexiest of the four things listed – people love to talk about it as a reason for making a decision in poker. It implies an expertise in the subtle nuances of the way the match is going, a mastery of "feel" poker that is far cooler to talk about than simply understanding the implications of your opponent's opening and limping ranges. Gameflow is also often used very incorrectly, so while it is certainly a factor to consider, it is important to get it right.

The biggest thing to be noticing is how your opponent seems to be adjusting to your wider 3-betting range. If you see him increase his limping and/or openfolding frequencies after getting 3-bet a lot, his raising range is not the same as it was 20 hands ago. Gameflow is all about paying attention to what your opponent thinks your ranges are and what kinds of adjustments to expect in response.

Opening range, looseness/aggression of your opponent, the properties of the hand you're dealt, and gameflow – these are the main factors that determine when to 3-bet light.

# Sizing your 3-bets based on hand, opponent, and stack depth

A common theme of this ebook is exploiting your opponent's tendencies given the characteristics of your hand and the situation you are in, and not excessively worry about balance or playing an unexploitable strategy. If you're playing unexploitably, you're not exploiting your opponent. That axiom holds true when sizing 3-bets, as well. To maximize expectation, it is important to vary your 3-bet sizing based on the details of the situation, rather than just using a static 3-bet sizing whenever you go to click the button to re-raise preflop.

## *1. The specific hand you have matters.*

How well does your hand play postflop against marginal middling hands like J8o, Q9o, and 75s? Hands like AK and ATs play poorly against these type of holdings out of position – the ace especially is a very overt part of your 3-betting range and not a big portion of the range your opponent will call the 3-bet with, so your opponent's range plays pretty well against Ax. Hands like KQ, KJ, and premium pairs play much better with smaller 3-bets – you'll get a lot of credit on ace high flops, dominate more of your opponent's calling range, and just generally make it so that your opponent can less profitably call in position.

Even though we are taking advantage of the qualities of our hand, our ranges do not have to be all that unbalanced. We can make bigger 3-bets with big aces, 88-TT, and some bluff hands, which means that we have plenty of hands that are willing to get it in, as many hands as we want that are folding to 3-bet jams, and some hands that play both well and poorly on any flop texture. Similarly, with our smaller 3-bet sizing, we have some hands like KJo and KTs (plus some bluffs) that generally aren't willing to get it in, but also monster big pairs that give our opponent a worse risk/reward price on a 4-bet jam. You can argue that we become marginally unbalanced in certain situations, but for the most part, there will be strong and weak holdings in both ranges, while still taking advantage of the properties of our hand.

*"We want to charge price insensitive villains as much as they are willing to put in"*

## *2. Your opponent's tendencies matter.*

If your opponent is calling a lot of 3-bets, experiment in making your sizings bigger, and see what happens. Even if you are already making it bigger than pot with AKo, and your opponent is now calling in position with insufficient expectation with hands like T7o, it is often worth it to see if they will call bigger sizings as well. We want to charge price insensitive villains as much as they are willing to put in, not just stick to our own informed understandings of what makes for a normal 3-betting size. This goes back to another pervasive theme: Don't just do something that's profitable, do what's most profitable. If your opponent is conservative against aggression, smaller 3-bet sizings will often work better, especially with your bluff hands, as your risk/reward calculation gets even more favorable. When you have a value hand against a conservative opponent, you wish your opponent were spewier, but your optimal 3-bet sizing is still unlikely to be more than the size of the pot.

That advice is fairly basic, but when you start to get a little deeper into the specifics, it becomes clear that there is a lot more involved. If your opponent opens wide but rarely 4-bet bluffs (a common default tendency of many regular players), your opponent's range contains a ton of hands that are folding against a 3-bet.

Take an opponent who raises 100% of his hands from the button, and assume that a 3-bet to t150 will cause him to continue with the following range:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A A | AxKx | AxQx | AxJx | AxTx | Ax9x | Ax8x | Ax7x | Ax6x | Ax5x | Ax4x | Ax3x | Ax2x |
| AxKy | K K | KxQx | KxJx | KxTx | Kx9x | Kx8x | Kx7x | Kx6x | Kx5x | Kx4x | Kx3x | Kx2x |
| AxQy | KxQy | Q Q | QxJx | QxTx | Qx9x | Qx8x | Qx7x | Qx6x | Qx5x | Qx4x | Qx3x | Qx2x |
| AxJy | KxJy | QxJy | J J | JxTx | Jx9x | Jx8x | Jx7x | Jx6x | Jx5x | Jx4x | Jx3x | Jx2x |
| AxTy | KxTy | QxTy | JxTy | T T | Tx9x | Tx8x | Tx7x | Tx6x | Tx5x | Tx4x | Tx3x | Tx2x |
| Ax9y | Kx9y | Qx9y | Jx9y | Tx9y | 9 9 | 9x8x | 9x7x | 9x6x | 9x5x | 9x4x | 9x3x | 9x2x |
| Ax8y | Kx8y | Qx8y | Jx8y | Tx8y | 9x8y | 8 8 | 8x7x | 8x6x | 8x5x | 8x4x | 8x3x | 8x2x |
| Ax7y | Kx7y | Qx7y | Jx7y | Tx7y | 9x7y | 8x7y | 7 7 | 7x6x | 7x5x | 7x4x | 7x3x | 7x2x |
| Ax6y | Kx6y | Qx6y | Jx6y | Tx6y | 9x6y | 8x6y | 7x6y | 6 6 | 6x5x | 6x4x | 6x3x | 6x2x |
| Ax5y | Kx5y | Qx5y | Jx5y | Tx5y | 9x5y | 8x5y | 7x5y | 6x5y | 5 5 | 5x4x | 5x3x | 5x2x |
| Ax4y | Kx4y | Qx4y | Jx4y | Tx4y | 9x4y | 8x4y | 7x4y | 6x4y | 5x4y | 4 4 | 4x3x | 4x2x |
| Ax3y | Kx3y | Qx3y | Jx3y | Tx3y | 9x3y | 8x3y | 7x3y | 6x3y | 5x3y | 4x3y | 3 3 | 3x2x |
| Ax2y | Kx2y | Qx2y | Jx2y | Tx2y | 9x2y | 8x2y | 7x2y | 6x2y | 5x2y | 4x2y | 3x2y | 2 2 |

With any two cards, making this 3-bet is already preferable to folding, even if we were to check/fold every single time postflop! Since clearly we can do much better than that, it shows not just the value of 3-betting wide against a player with these tendencies, but also of making it on the smaller side, especially with bluff hands against a fit-or-fold player.

There are a lot of other tendencies to think about, so this is just to get you started. How often your opponent will 4-bet is often very important in determining 3-bet sizing, which leads well into the third part of this article.

### *3. The effective stack size matters.*

The two important aspects of stack size are how often your opponent will 4-bet, and how well your hand will play postflop if you are flat called. At shorter stacks (less than 25bb deep), hands like big aces tend to just be correct to jam over a minraise, rather than make a non-all-in 3-bet. This only changes when you learn your opponent is willing to 4bet wide, particularly with weak aces and suited connectors, which will generally happen when your opponent suspects you are frequently 3-bet bluffing. At this point, the value from making a smaller 3-bet with AK goes way up, as your opponent may fold A3o to an all-in jam, but 4-bet shove against a non-all-in 3-bet. However, if that is not the case, it is generally a mistake to make non-all-in 3-bets less than 25bb deep with premium Ax hands, and particularly a mistake when the sizing is small, allowing tons of middling hands to correctly come into the pot in position against your holding.

When it is optimal against a player to have a balanced non-all-in 3-betting range less than 25bb deep, it is generally best either to leave yourself with a potsized bet to go all-in on the flop (or c-bet/call all flops comfortably), or a ratio that allows you to continuation bet/fold on the flop if necessary. At deeper stacks, your 3-bet size mostly determines your opponent's 4bet jamming options – whether they can 4bet/fold, and how comfortable they can 4bet jam all-in. Again, this is why a size of 150 can work really well over a t60 open against a wide button opener – it can be really awkward for your opponent to 4-bet bluff given the risk/reward you are offering, particularly when your opponent only knows how to go all-in when making a 4-bet. Few random opponents will know how to make a re-raise to t290 in position as a bluff against this play, and make optimal decisions postflop if flatted.

# How to adjust against players with a high 3-bet percentage

*Now you know more about how and when to increase your 3-betting frequency in response to your opponent's tendencies. People are often also very curious about the opposite question – what do you do when you are that reg who is getting 3-bet frequently? How do you adjust? Here are the main points to concentrate on.*

**1. 4-bet wider.** I believe that going all-in has the best expectation readless with any small pair against a pot-sized 3-bet 50bb deep, but you can extend that to 75bb deep against a frequent 3-bettor. Suited Ax hands should be jammed as well. Whether or not to develop a 4-bet bluffing range depends on the qualities of your opponent - most maniacs who 3-bet wide will also get it in rather wide as well, and it can be a mistake to try to 4bet bluff. Realize that when you jam with A5s or 33, you are not really bluffing. Occasionally you will get a better hand to fold, but the majority of your equity comes from the fact that your hand is stronger than your opponent's 3-betting range. Sure, technically you are folding out a T8s type hand that has the correct equity to call against your specific holding, but the real point is that your hand is quite strong against that 3-betting range. Against good, thinking regs who keep raising from t60 to t150 every hand 40-50bb deep, it is essential to develop a 4bet bluffing range. Especially if your opponent sees you as conservative (which may be why they are employing this strategy), they will likely start out by giving your 4-bets a lot of credit.

**2. Experiment with limping.** Especially shortstacked, I often advise limping against frequent 3-bettors with hands that flop well but aren't quite strong enough to call a 3-bet jam. The same concept can be applied to deeper stacked play. Think about those hands that aren't quite strong enough to call a potsized 3-bet: T7o, J8o, Q8o, K8o, Q6s, etc. These hands can work great in a limping range, primarily because they are all strong enough to call a 3x raise if your opponent gets aggressive against limps, and all play well in limped pots. Having a middling limping range gives your opening range a much higher percentage of monsters, and if your opponent fails to adjust to that, you'll make a ton of money off a 3-bet range that is way too wide for your opening range. You will also have very positive expectation playing these middling hands in position with a limp, significantly better than consistently minraise/folding.

**3. Give serious thought to gameflow.** Especially against thinking regs, who can be particularly transparent about it, exploiting unbalanced tendencies in their gameflow adjustments can be very profitable. I have a large sample against one opponent, for example, who 3-bets wide but can be rather obvious about it gameflow wise - if he has not 3-bet in 5-10 opportunities, there is a very high chance he is bluffing, and if he just 3-bet or made some fancy move the previous hand and won the pot, he will rarely ever 3-bet wide right after it. A lot of regs are like this, trying to space out their 3-bets because of the impression that a third 3-bet in four opportunities is going to be treated as weak, and perceived as opponent going crazy with aggression. This means that you can actually play more aggressively against the first 3-bet in a while from a reg who has been 3-betting frequently over established history, and more conservatively against a 3-bet that comes at a more conventionally suspect time. Sure, you can level yourself all day with this analysis, but most regs will stay pretty consistently on the second level. Even though it is not true for every reg, what is universal is that you can make a lot of money by picking up on unbalanced frequencies relating to how your opponent reacts to gameflow, in either direction.

**4. Make sure you're not always playing fit-or-fold on the flop.** The wider your opponent's 3-betting range is, the greater percentage of that range will be air on the flop. Especially if you have a nitty image and your opponent is not a calling station, you have to take advantage of the fact that when you call a 3-bet with 89s and the flop comes J72, your opponent's percentage of overpairs and Jx is far lower than if he were 3-betting a tight range. Pick your spots to contest, especially when you can credibly represent hands and you have a tight image that your opponent is capable of noticing.

**5. Remember that your opponent's flatting range is vitally important, too.** Whether or not you should fold more of your weak hands preflop from the button depends on how many hands your opponent is playing OOP, not just how often he is re-raising. He can be 3-betting 40%, but if he never just calls, it is still correct to raise it up into the maniac with your 23o. The higher his VPIP in the big blind is, the more junky hands you should be willing to fold.

**6. Focus on the composition of his 3-betting range, not just the frequency.** If your opponent is 3-betting a polarized range (strong hands and much weaker holdings), that is a great recipe to start making small 4-bet bluffs. Additionally, the composition of the 3-betting range tells you a great deal about how to play pots when he just calls OOP, rather than re-raising. If he 3-bets really wide for value, you should give him even less credit on ace and king high boards when he flats a button open, and you should be prepared to 3-bet bluff the flop when he check/raises them. This is a concept I have seen students do well in understanding the logic of, but do a poor job of actually applying in-game. Sometimes, the most important thing you learn from seeing certain hands in one range is that those hands are NOT in another range. One broader example of this is that people generally do an extremely poor job of changing their c-betting range against opponents who donkbet frequently for value. Because of this frequency, many hands that would continue against a continuation bet are no longer in the big blind's checking range, and it becomes correct to c-bet a very wide range even on typically dangerous flop textures.


It can be frustrating to play against very aggressive opponents, especially when you feel you are too card-dead to take advantage. The way to maximize your expectation is to focus on your opponent's frequencies and react to the composition of those ranges. Force your opponent to either make large errors or adjust to your changes, and realize that the strength of your holdings dramatically changes when your opponent has atypically weak ranges. Stay ahead of your opponent's approach and keep him as the one who is aggravated at your frequencies.

## How and When to check/raise the flop light

**The 3-bet light article noted four main factors to consider:**

1. *Your opponent's opening range.*
2. *How loose/aggressive your opponent is preflop and postflop.*
3. *The properties of the specific hand you've been dealt.*
4. *Your perceived 3-betting range and your opponent's willingness to adapt. (Gameflow)*

Seeing the parallels between fundamentally similar poker decisions that take place in different contexts can help dramatically in becoming an advanced player. One "a-ha!" moment students have told me about is when I described to them how alike the thought processes of whether to 3-bet light preflop and check/raise light on the flop are. The wider your opponent opens preflop, the lower percentage of hands he can continue with for value on the flop, no matter what the texture is. If your opponent calls check/raises loosely and loves to play back at you, that decreases the expectation of check/raising as a bluff, just like loose play decreases your expectation of 3-betting light preflop. If you check/raise with a hand that has some additional potential for equity with it, or provides a blocker to a possible hand your opponent might be able to continue with, that increases the expectation of the play. Fourthly, if you've been check-raising a bunch of flops, you better be prepared for your opponent to adjust his ranges and/or play back at you when you contest another dry board. In these respects, deciding whether to check/raise light is extremely similar to deciding whether to 3-bet light.

Getting to the flop adds another layer of complexity, though, and there are two more factors to heavily consider:

5. *Your opponent's continuation betting range.*
6. *The flop texture.*

The more often your opponent c-bets, the better check-raising light will be. Additionally, some opponents like to check behind with middle, bottom pair, or ace high – this means that their c-betting range has an even higher percentage of complete air hands, which adds to the attractiveness of a small check/raise. Furthermore, pay special attention to opponents who like to make different c-bet sizings on different board types – bigger bets on drawy boards when they have a made hand, for example – as that can be another big help in deciding whether or not a c-betting range is weak enough to check/raise light.

The flop texture is another important consideration. On a JT9 board with a flush draw, not only do most opponents tend to c-bet less frequently with weak holdings, they will also have a piece of the flop more often than if it were a much dryer flop. Thus, check/raising a hand with no additional equity is going to be suicide against most opponents. The flop texture also determines what you can represent from out of position. In more advanced games around 12-18bb deep, check/raising dry jack-high and ten-high boards can be extremely profitable, because thinking opponents generally c-bet these flops with a wide range, and then when you check/raise, it's very easy for you to represent connected Jx/Tx type hands, which are prime flatting hands that short.

In terms of sizing, against most opponents on most board textures, your check/raise size does not need to be particularly large. Check/raising light takes advantage of the fact that your opponent has a lot of garbage in his c-betting range, and a simple raise from t80 to t200, for example, generally does the trick just fine. In the "extensions" section there is an article that talks about underbetting theory – when you read that, think back on how it might apply to check-raising sizes on dry boards.


Check/raising light gets a lot of beginning and intermediate players out of their comfort zone when trying to do it, because it produces a lot of tricky, novel situations on future streets once called, and it can feel unnecessarily risky. However, focus on expectation, not your preconception of risk: It is actually far more risky to try to make as much money as you can while constantly passing up on +EV situations, and you can very easily find yourself experiencing significantly more variance in your profit if you are consistently unwilling to bluff. Sure, there are some complicated questions that come afterward: What do I do when I bluff and then hit middle pair on the turn? What do I do when I still have air and am not sure whether or not I need to keep bluffing? Putting unnecessary chips into the pot out of position with no hand does feel uncomfortable to a lot of developing players. However, when the conditions are right, check/raising the flop light is essential to maximizing your winnings, and as you see more and more of those situations, you will get less and less troubled by them.

# The Fundamentals of Barreling

*Barreling, a term for making strong bets on multiple streets (more often in bluffing contexts), is one of the strongest weapons you have at your disposal in HUSNGs.*

To understand why, think about the situation from the other perspective: When you check/call the flop readless, what is your range like? Does that range enjoy facing sizable bets on the turn and the river? When you play competent, aggressive opponents, do you feel like it is easy to optimally adjust your ranges and pick these bluffs off, or do you constantly feel like you are in a guessing game about whether you are about to make a big call or get owned by a value hand? If you are like most people, myself included, you hardly love your life playing against that opponent. Because of that, it is worth learning how to barrel yourself and become that opponent that people don't want to face.

Let's start with a simple base case, again from the bluffcatcher's perspective. You have J7s and call a minraise OOP. Your opponent has been playing a wide range of hands on the button, around 80% or so. The flop comes AJ6, with no flush draw. Your play seems easy, and it is, just check/calling is almost always going to be best. The turn is a 2, completing the fourth suit. You check, and your opponent fires out 70% of the pot.

Suddenly, your opponent represents nothing for value that is worse than your hand. There are also no draws in his range, other than 54/43/53 gutshots, some of which he would not even play preflop. Essentially, either your opponent has a stone cold bluff, or he has a hand better than yours. Because of this reality, some players would elect to fold right here. Others would stubbornly cling on for another street, but when facing a river bet, generally give the hand up readless. It is a lot to put your opponent on a stone cold bluff when he has plenty of value hands in his range as well.

That is the reality that we need to take advantage of when we are in the button's shoes in this hand. Given a 100% c-bet frequency on this flop, J7s is behind in the hand just 26% of the time once the deuce hits the turn, and yet most players will fold it to later aggression. My readless call pre, check/call flop range here 50bb deep is generally something like this:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A A | AxKx | AxQx | AxJx | AxTx | Ax9x | Ax8x | Ax7x | Ax6x | Ax5x | Ax4x | Ax3x | Ax2x |
| AxKy | K K | KxQx | KxJx | KxTx | Kx9x | Kx8x | Kx7x | Kx6x | Kx5x | Kx4x | Kx3x | Kx2x |
| AxQy | KxQy | Q Q | QxJx | QxTx | Qx9x | Qx8x | Qx7x | Qx6x | Qx5x | Qx4x | Qx3x | Qx2x |
| AxJy | KxJy | QxJy | J J | JxTx | Jx9x | Jx8x | Jx7x | Jx6x | Jx5x | Jx4x | Jx3x | Jx2x |
| AxTy | KxTy | QxTy | JxTy | T T | Tx9x | Tx8x | Tx7x | Tx6x | Tx5x | Tx4x | Tx3x | Tx2x |
| Ax9y | Kx9y | Qx9y | Jx9y | Tx9y | 9 9 | 9x8x | 9x7x | 9x6x | 9x5x | 9x4x | 9x3x | 9x2x |
| Ax8y | Kx8y | Qx8y | Jx8y | Tx8y | 9x8y | 8 8 | 8x7x | 8x6x | 8x5x | 8x4x | 8x3x | 8x2x |
| Ax7y | Kx7y | Qx7y | Jx7y | Tx7y | 9x7y | 8x7y | 7 7 | 7x6x | 7x5x | 7x4x | 7x3x | 7x2x |
| Ax6y | Kx6y | Qx6y | Jx6y | Tx6y | 9x6y | 8x6y | 7x6y | 6 6 | 6x5x | 6x4x | 6x3x | 6x2x |
| Ax5y | Kx5y | Qx5y | Jx5y | Tx5y | 9x5y | 8x5y | 7x5y | 6x5y | 5 5 | 5x4x | 5x3x | 5x2x |
| Ax4y | Kx4y | Qx4y | Jx4y | Tx4y | 9x4y | 8x4y | 7x4y | 6x4y | 5x4y | 4 4 | 4x3x | 4x2x |
| Ax3y | Kx3y | Qx3y | Jx3y | Tx3y | 9x3y | 8x3y | 7x3y | 6x3y | 5x3y | 4x3y | 3 3 | 3x2x |
| Ax2y | Kx2y | Qx2y | Jx2y | Tx2y | 9x2y | 8x2y | 7x2y | 6x2y | 5x2y | 4x2y | 3x2y | 2 2 |

It is actually probably even wider, as I like to play more offsuit 6x hands preflop than this, but I tempered it a little so that my unusual OOP playing frequency does not interfere with the point of the article. Notice that this range is pretty damn weak, and "capped", which means it does not have any super hands in it. In fact, the strongest holding is an ace with a mediocre kicker (the better aces I am likely to 3-bet preflop or check/raise the flop), and even with that hand, you can't love it when your opponent triple barrels with sizable bets – once again, you beat nothing other than a stone cold bluff against most opponents.

The frequency of me having an ace on this flop is very low, and because all of the rest of the range is highly likely to give up to three streets of aggression readless, I am a sitting duck just waited to be exploited. The weak aces are even folding sometimes, too: What do you really beat after facing such strong bets on that board except a total bluff?

That reality means you have to take advantage of the situation and barrel off with a high frequency until I catch on. A good double or triple barrel means correctly taking into account three main factors: How your opponent perceives your range, how your opponent perceives his own range, and your opponent's actual range.

*"If you fail to take advantage of this very favorable situation when you have air, you miss out on a lot of +EV plays."*

The first aspect of this is whether your opponent is doing any thinking about your range at all. Many recreational opponents will think only in terms of the strength of their hand in deciding whether to continue ("Is a pair of jacks a good enough hand to call a bet on this turn?"), and while that implies some reflection on what you might have, it is a very different thought process than one that a more advanced player would have.


If your opponent is able to realize that you only have a stone cold bluff or a better hand than they do, barreling off on dry boards becomes much better. If your opponent is able to realize that you have a wide range on the flop, and are capable of continuing to contest with that wide range on the turn, then barreling off becomes worse. However, even opponents who think at a very high level do not know your frequencies until you reveal them. Expert players are doing what I advocate in this ebook: Playing against what people do in general, as they start to figure out the tendencies of specific opponents. The general population rarely barrels off on these type of boards with no additional equity whatsoever, and you can trust that good opponents you play will be taking advantage of this and making hero folds. They will be good folds against the general population, but they will be bad folds against your tendencies. That is often what you are taking advantage of when you barrel off as a bluff.

Start thinking about more situations where your opponent's range is capped, and your range contains many very strong hands. If you fail to take advantage of this very favorable situation when you have air, you miss out on a lot of +EV plays.

# Readless Ranges: Big Blind Play 20bb Deep Against an Unknown

When we do not know what our opponents frequencies are, we maximize our expectation by playing against the aggregate frequencies of our opponents, which I like to call "population tendencies". Sure, sometimes we will end up being too aggressive, and sometimes we will end up not being aggressive enough, but that is inevitable no matter what strategy you use readless. You make the most money by playing against the population tendencies, and then adjusting with good Bayesian thinking once you start to see what your opponent in particular is doing.

For this article, let's work with a specific example: What to do 20bb deep readless from the big blind. Remember that we will never actually be truly readless, as we have certain information at our disposal before the first hand is even dealt. There are some jokes to be made here about knowing the nationality of our opponent and how dumb the screenname is, but I mostly mean having never seen a screenname before and thus having no information about it actually is a read that we should be taking into account. Unknown opponents are far more likely to be recreational players, and we should shade our expectations accordingly. I believe unknown screennames generally open for a raise less often than known players, probably somewhere between 50-65% of hands, limping some others. To calculate, let's use a 55% opening range (specifically, ProProkerTools' top 55%, which is much better for this than PokerStove's). If we go all-in, we'll use a calling range for our opponent of any pair, A5o+, A3s+, KTo+, K9s+, and QTs+. This includes some light hands, but nothing crazy, and encapsulates the idea that we will occasionally get some random rather light calls from this type of opponent, but not super frequently.

Based on these conditions, here is a table of the expectation from going all-in over the minraise from the big blind. For those not familiar with these type of charts, the pairs go diagonally down the middle of the table, with suited hands above the pairs and offsuited hands below the pairs. The expectation is referenced from the start of the hand – so when we go all-in with A3s with effective stacks of 20bb, this table means that we should expect, on average, to end up with 20bb at the end of the hand: 0EV. Note that if we were to fold, we would be left with 19bb, so shoving is clearly better than that. If we were to just call, it is hard to say exactly what our expectation is, but based on my historical results calling with various hands, I predict that calling would do slightly worse than 0EV from the start of the hand. A3s is also a hand that plays very poorly making a non-all-in 3-bet, allowing opponents to call in position with hands that have very good equity against it. Thus, I consider a 3-bet shove the best option, and the square is colored green.

| | A | K | Q | J | T | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 6.1 | 3.3 | 2.7 | 2.3 | 1.6 | 1.2 | 0.8 | 0.5 | 0.2 | 0.2 | 0.1 | 0EV | -0.1 | |
| K | 3.0 | 5.0 | 0.7 | 0.3 | -0.1 | -0.6 | -0.9 | -0.9 | -0.9 | -1.0 | -1.1 | -1.2 | -1.2 | |
| Q | 2.4 | 0.2 | 4.3 | -0.1 | -0.3 | -0.6 | -0.8 | -1.0 | -1.0 | -1.1 | -1.2 | -1.3 | -1.3 | |
| J | 2.0 | -0.2 | -0.6 | 3.8 | -0.2 | -0.5 | -0.7 | -0.9 | -1.1 | -1.2 | -1.2 | -1.4 | -1.4 | 3-bet/Call |
| T | 1.5 | -0.6 | -0.8 | -0.7 | 3.2 | -0.4 | -0.6 | -0.8 | -1.0 | -1.3 | -1.3 | -1.4 | -1.5 | |
| 9 | 0.8 | -1.1 | -1.2 | -1.0 | -0.9 | 2.7 | -0.6 | -0.8 | -1.0 | -1.2 | -1.5 | x | x | 3-bet shove |
| 8 | 0.4 | -1.4 | -1.4 | -1.3 | -1.2 | -1.1 | 2.3 | -0.7 | -0.9 | -1.1 | x | x | x | |
| 7 | 0.1 | -1.4 | -1.6 | -1.5 | -1.4 | -1.3 | -1.2 | 1.9 | -0.8 | -1.0 | x | x | x | Call |
| 6 | -0.2 | -1.5 | -1.6 | -1.7 | -1.7 | -1.5 | -1.4 | -1.3 | 1.5 | -0.9 | -1.1 | x | x | |
| 5 | -0.3 | -1.6 | -1.7 | -1.8 | x | x | x | x | x | 1.0 | -1.0 | x | x | Fold |
| 4 | -0.4 | -1.6 | -1.8 | -1.8 | x | x | x | x | x | x | 0.7 | x | x | |
| 3 | -0.5 | -1.7 | -1.9 | -2.0 | x | x | x | x | x | x | x | 0.4 | x | |
| 2 | -0.6 | -1.8 | -2.0 | -2.0 | x | x | x | x | x | x | x | x | 0EV | |

In the traditional paradigm of looking at 3-bet shoving (is it better than folding?), 35% of hands make the cut, being equal to or better than -1.0bb from the start of the hand. However, be very careful about this: Even if J8s is a +EV all-in against this opening and calling range when compared to folding, this is a very silly comparison – we are never folding J8s to a minraise at this stack depth. That is why I think it is better to reference the expectation from the start of the hand and not to folding, as it reminds us that shoving needs to be better than all other options in order for us to maximize our expected value.

Lifetime, with [Q8s, Q7s, J9s, J8s, J7s, T9s, T8s, T7s, 98s, 97s, 87s], a cluster of hands like J8s, I am 0EV from the start of the hand from flatting. That is a whole 1bb in expectation better than folding, and much better than the expectation shown in the table for
shoving, which are between -0.5bb and -1.0bb from the start of the hand for this cluster. That is why all these hands should be flatted readless against an unknown opponent 20bb deep, not jammed.

When you actually narrow it down to the hands that are worth 3-betting, it's about 19.5% of hands. Because your opponent will openfold more often when you have strong holdings due to card removal, the true percentage you will actually make a 3-bet is even
lower.

Despite their mediocre equity from jamming, KQ, KJ, KTs, and QJs do extremely well in 3-bet pots, and gain a lot of value from making a potsized 3-bet and inducing calls from loads of dominated hands, or hands with two undercards, that we play very well against on the flop. I recommend 3-bet/calling these hands
readless and bet/calling a ton of flops when you get flatted. Along with those hands can go your premium pairs, which also want to get flatted by a wider range.

3-bet bluffing with non-allin bets when readless is a different story, and I would be willing to consider arguments that this leads to the best expectation for hands like J3s readless. However, the math is pretty clear that it is spew to jam with these sorts of hands without evidence that your opponent is very likely opening a wide range, unless you disagree with my initial assumptions and think that the unknown opponent opens wider or calls tighter. Once you believe your opponent is opening wider, the math changes considerably.

# Jamming Expectation Against a Frequent Button Opener 20bb deep

*The effects of changes in your opponent's opening range on your optimal play from the big blind are drastic. In the last article, we talked about facing an opponent who raises 55% of buttons. Let's change that to 70%. It's only a 15% difference, but when we are dealing with thin edges in the first place, it makes a world of difference.*

Here is a table of expectation for jamming 20bb deep against one 70% minraiser. We'll use the same calling range as last time: Any pair, A5o+, A3s+, KTo+, K9s+, QTs+. Again, the table uses expectation from the start of the hand as its reference point. Anything better than -1.0bb is better than folding. On this table, I have left out my recommendations for what to do, and all the shading is just based on thresholds: Green is better than 0EV, yellow is between 0EV and -1.0bb, and red is worse than -1.0bb. Let's take a look:

| | A | K | Q | J | T | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 5.1 | 3.0 | 2.6 | 2.2 | 1.9 | 1.4 | 1.1 | 0.8 | 0.6 | 0.6 | 0.5 | 0.4 | 0.4 |
| K | 2.8 | 4.3 | 1.0 | 0.7 | 0.4 | 0EV | -0.2 | -0.3 | -0.3 | -0.3 | -0.4 | -0.5 | -0.5 |
| Q | 2.3 | 0.6 | 3.9 | 0.3 | 0.2 | -0.1 | -0.2 | -0.4 | -0.4 | -0.5 | -0.5 | -0.6 | -0.7 |
| J | 2.0 | 0.3 | -0.1 | 3.4 | 0.2 | 0EV | -0.1 | -0.3 | -0.5 | -0.5 | -0.6 | -0.6 | -0.7 |
| T | 1.6 | 0EV | -0.2 | -0.2 | 3.0 | 0.1 | -0.1 | -0.3 | -0.4 | -0.6 | -0.6 | -0.7 | -0.8 |
| 9 | 1.1 | -0.5 | -0.5 | -0.4 | -0.3 | 2.5 | -0.1 | -0.2 | -0.4 | -0.6 | -0.7 | -0.8 | -0.9 |
| 8 | 0.7 | -0.7 | -0.7 | -0.6 | -0.5 | -0.5 | 2.2 | -0.1 | -0.3 | -0.5 | -0.7 | -0.9 | -0.9 |
| 7 | 0.5 | -0.7 | -0.9 | -0.8 | -0.7 | -0.7 | -0.6 | 1.9 | -0.2 | -0.4 | -0.6 | -0.8 | -1.0 |
| 6 | 0.2 | -0.8 | -0.9 | -1.0 | -0.9 | -0.8 | -0.7 | -0.7 | 1.6 | -0.3 | -0.5 | -0.7 | -0.9 |
| 5 | 0.2 | -0.8 | -0.9 | -1.0 | -1.1 | -1.0 | -0.9 | -0.9 | -0.8 | 1.3 | -0.4 | -0.6 | -0.8 |
| 4 | 0.1 | -0.9 | -1.0 | -1.1 | -1.1 | -1.2 | -1.1 | -1.1 | -1.0 | -0.8 | 1.0 | -0.7 | -0.9 |
| 3 | 0.1 | -0.9 | -1.1 | -1.1 | -1.2 | -1.3 | -1.4 | -1.3 | -1.2 | -1.1 | -1.1 | 0.7 | -1.0 |
| 2 | 0EV | -1.0 | -1.1 | -1.2 | -1.3 | -1.4 | -1.4 | -1.5 | -1.4 | -1.3 | -1.3 | -1.4 | 0.4 |

Now, the expectation of going all-in is better than folding with nearly any two suited cards, and lots of marginal offsuited holdings, even trash like 54o. Every time your opponent raise/folds, 10% of his stack gets shipped over to you. The more often your opponent is raise/folding, the better taking a very aggressive approach from the big blind becomes. However, consider the information presented in the last article: Lifetime, with [Q8s, Q7s, J9s, J8s, J7s, T9s, T8s, T7s, 98s, 97s, 87s] a cluster of hands like J8s, I am 0EV from the start of the hand from flatting. Presumably, your expectation from flatting J8s is even better when your opponent is playing lots of weak hands from the small blind. Given this, even though our table lists J8s as having an expectation of -0.1bb, which is 0.9bb better than folding, it may still be better to just call from the big blind.

*"It is sometimes difficult for people to understand that not going all-in with J2s for 20bb can be a hideously bad play"*

Does that mean the same conclusion is true, and we should maintain a fairly tight 3-bet jamming range? Absolutely not. Consider hands like Q2s, Q3s, J2s, J3s, J4s, T3s, T4s and 63s. All have jamming expectations of at least 0.3bb better than folding, and all are mediocre hands that you probably toss into the muck as standard at this stack depth against this opponent because they play poorly when you just call out of position. That's a mistake. Very often these hands become 3-bets, either as all-in jams or non-all-in 3-bet bluffs.

The table becomes even more drastic when your opponent starts raising close to 100% from the button. There is a strong theoretical argument that raising 100% is not optimal in equilibrium from the small blind which is worth thinking through. If the button were to commit to raising 100% every time, it essentially means that the button is putting in 2bb before the start of the hand, the big blind is putting in 1bb, and it's the big blind's turn to act. This is very similar to considering both players just 10bb deep, with an inverted position structure. The big blind even gets to call and automatically see the flop whenever it is optimal, whereas traditionally 10bb deep, the small blind must limp in and hope the big blind does not raise. True, there are some caveats – NASH is not +EV from the small blind 10bb deep anyway, and a lot of the small blind's presumed positive expectation comes from being able to minraise or limp and play the pot in position. Talk about it with your poker friends and see what conclusions you come to: Is it possible for 100% to be the GTO minraising frequency from the small blind 20bb deep? If not, what stack depth might it become GTO, if ever?

Regardless of that tangent, jamming close to any two cards becomes better than folding over a 100% minraiser with this calling range. The expectation from jamming J8s goes all the way up to +0.5bb from the start of the hand, surely better than the expectation from flat calling. The expectation from jamming J2s is now +0.1bb from the start of the hand, which means if you fold it preflop against this opponent, you do 1.1bb worse than jamming. For comparison's sake, that's like folding J9s to a minraise readless – a massive leak. It is sometimes difficult for people to understand that not going all-in with J2s for 20bb can be a hideously bad play, but given these parameters, it absolutely is. Every time you catch yourself making a 3-bet with a marginal hand, or not making a 3-bet with a marginal hand, while not even bothering to consider your opponent's opening range, you lose money.

However, calculations in the real world are not easy. You do not always have a good sense of the percentage your opponent is opening, whether that range contains all of his strong hands, how your opponent is starting to adjust to you, what your opponent's calling range is, and all sorts of other factors. The goal of this article is not to get you to look at your HUD number for opening range and start to make mechanical decisions based on expectation tables. Some of the best HUSNG players have no idea what the expectation is of going all-in with J4s against a 70% minraiser, but rather, are very good at observing frequencies naturally and using great poker intuition to approximate expectation in-game based on more than just the raw aggregate numbers.

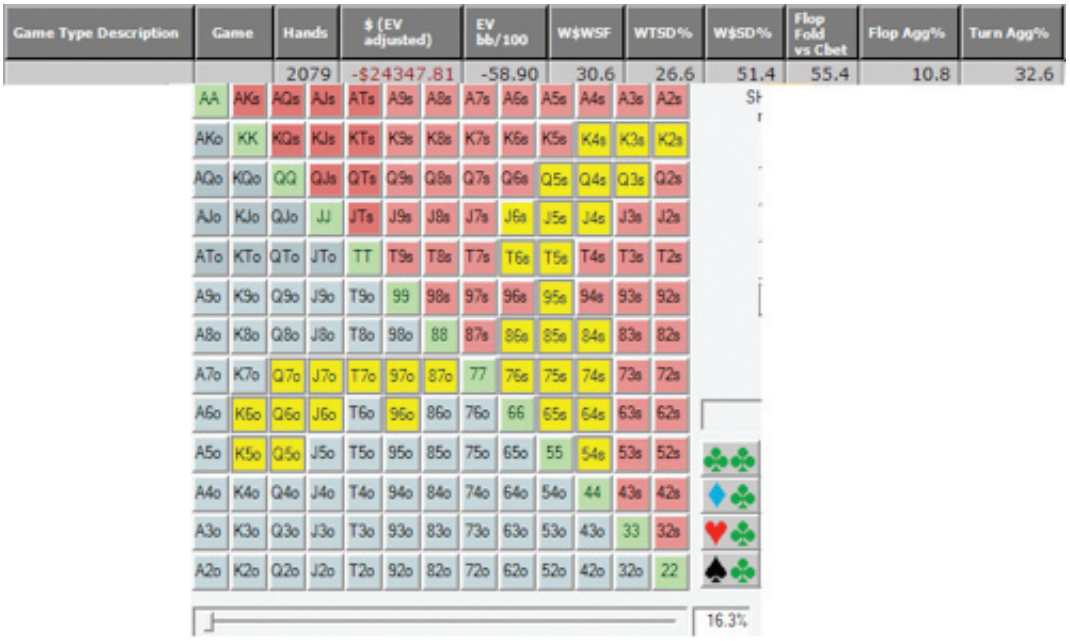
Understanding how your expectation from 3-betting changes against different opening ranges does not solve big blind endgame play, but it can certainly keep you from making significant errors over and over again in common situations. Do not revert to static strategies and conceptions of whether a certain hand is "good enough to play for all the chips with" at a certain stack depth. You always have to heavily take into account what your opponent is doing. That is where the vast majority of the edge comes from in superturbos.

# Optimal VPIP Out of Position

*I have played nearly a million hands of online poker in my career. There are a lot of benefits to having this much experience, but one of the most overlooked is that you can actually have a meaningful sample size to look at for how you play so many different situations.*

Not sure if you're making money by playing certain hands in certain ways? Look it up! A recent debate on a poker forum ended very quickly when a student of mine bragged about obtaining a certain expectation by limping in an unconventional situation. I posted that over a significant sample size, my expectation had been nearly a full big blind better. Upon hearing this, he quickly conceded that his position was probably incorrect, punctuating the conclusion by saying "more debates with numbers to back them up, please". One big check to make sure you do not get too lost in theory-land is the actual results of your plays: The proof is in the pudding, as the phrase goes. If you can show that a strategy makes the most money, then you can imply the strategy makes the most sense. I have found falling back on my statistics to answer questions about my own play to be an invaluable tool in getting better.

After a small downswing, I once got paranoid that I was playing too many hands out of position in super-turbos. Calling all these marginal 84s, 96o, K5o type holdings – was I actually making money 20-25bb deep, or was I bleeding it away? I did a HEM query for the range shown in the image below at this stack depth facing a minraise, and here were my results:



| Game Type Description | Game | Hands | $ (EV adjusted) | EV bb/100 | W$WSF | WTSD% | W$SD% | Flop Fold vs Cbet | Flop Agg% | Turn Agg% |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2079 | -$24347.81 | -58.90 | 30.6 | 26.6 | 51.4 | 55.4 | 10.8 | 32.6 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA | AKs | AQs | AJs | ATs | A9s | A8s | A7s | A6s | A5s | A4s | A3s | A2s | |
| AKo | KK | KQs | KJs | KTs | K9s | K8s | K7s | K6s | K5s | K4s | K3s | K2s | |
| AQo | KQo | QQ | QJs | QTs | Q9s | Q8s | Q7s | Q6s | Q5s | Q4s | Q3s | Q2s | |
| AJo | KJo | QJo | JJ | JTs | J9s | J8s | J7s | J6s | J5s | J4s | J3s | J2s | |
| ATo | KTo | QTo | JTo | TT | T9s | T8s | T7s | T6s | T5s | T4s | T3s | T2s | |
| A9o | K9o | Q9o | J9o | T9o | 99 | 98s | 97s | 96s | 95s | 94s | 93s | 92s | |
| A8o | K8o | Q8o | J8o | T8o | 98o | 88 | 87s | 86s | 85s | 84s | 83s | 82s | |
| A7o | K7o | Q7o | J7o | T7o | 97o | 87o | 77 | 76s | 75s | 74s | 73s | 72s | |
| A6o | K6o | Q6o | J6o | T6o | 96o | 86o | 76o | 66 | 65s | 64s | 63s | 62s | |
| A5o | K5o | Q5o | J5o | T5o | 95o | 85o | 75o | 65o | 55 | 54s | 53s | 52s | |
| A4o | K4o | Q4o | J4o | T4o | 94o | 84o | 74o | 64o | 54o | 44 | 43s | 42s | |
| A3o | K3o | Q3o | J3o | T3o | 93o | 83o | 73o | 63o | 53o | 43o | 33 | 32s | |
| A2o | K2o | Q2o | J2o | T2o | 92o | 82o | 72o | 62o | 52o | 42o | 32o | 22 | |

16.3%

*(Click Image to Enlarge)*

Negative $24,000 in equity! Yikes! Remember, though, that we're always comparing against the next best option - if we think the next best option is not playing these hands, the expectation from folding is -1bb from the start of the hand, every time this happens. That's the same thing as -100bb per 100 hands. And as we can see from the stats, my expectation from calling is far, far better than this, at around -59bb per 100 hands. Thus, in general, folding one of these hands is about 0.4bb worse than calling, and that's over 2079 hands. If I had folded all of them, I'd be about 850 big blinds poorer! That's about 38 buy-ins in equity, thrown away out of a desire not to play pots out of position with marginal holdings. Surely, the expectation is helped by the inclusion of some stronger hands – perhaps you were never considering folding 76s. But even when you take out some of the best hands from this range, calling has still done significantly better than folding.

Holding nothing back, I include all of my stats. I show EV-adjusted numbers, so you know the numbers are not influenced by all-in luck. More importantly, though, I show other stats that look rather tame. There is a myth that if you play these sorts of hands, you have to be Mr. All-Star postflop, check/raise bluffing a ton and making your opponent fold the best hand. In reality, my flop play was pretty pedestrian: Check/folding over half the time with a low check/raise percentage, only winning the pot postflop around 31% of the time. That means a large majority of the time I called and lost postflop. It sure can really feel like we're just bleeding chips, and should stick to stronger holdings preflop.

The problem is, the math on that doesn't really add up. It's OK that we are losing these pots a lot. It's OK that we only go to showdown a little over a quarter of the time, and win the pot just a little over half the time there. Finding good spots to bluff turn when the flop is checked through and other reasonable contest situations, along with the equity from when we hit, is enough with these hands.

That's not to say you shouldn't check/raise bluff or put your opponents in tough situations - I think you can improve on my expectation by playing better postflop than my passive 5-tabling auto-pilot that likely characterizes a lot of these hands. My point is that the belief that you need to be a hero postflop to play 60% of hands is misguided.

First hand in a super turbo, readless, I think it's generally best to play about 55-60% of hands against a minraise, something like this:


*(Click Image to Enlarge)*

You can tinker with this and argue for a few more calls and/or a few more folds. However, what I'm mostly concerned about is the general sense of the borderline. In strategy threads, I often see posters saying that they would fold Q7o to a minraise, or K5o, or 74s, or Q4s, or J7o, or 95s. I think these are all significant mistakes.

This conclusion is not just for endgame play, either. First hand in a turbo or a reg speed against a minraise, you should not be playing less than 50% of hands. Here are my numbers with this same range, this time expanded for 20-48bb deep:

| Game Type Description | Game | Hands | $ (EV adjusted) | EV bb/100 | W$WSF | WTSD% | W$SD% | Flop Fold vs Cbet | Flop Agg% | Turn Agg% |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 4349 | -$61776.36 | -52.88 | 31.2 | 27.2 | 50.6 | 55.1 | 10.7 | 30.9 |

**20-48bb deep**

The results are more of the same, and actually even more pronounced that we should be playing these hands. Again, the story isn't phenomenal postflop play - my stats look thoroughly boring and like I should be getting run over. Again, though, while I am down -$62,000 in equity from these situations, I'd be down almost another $60,000 by NOT playing these hands. In summary, if it feels like you are bleeding money when you call wider OOP, maybe you are - but bleeding money by folding too much can be a hell of a lot worse.


I have one more point to make on this topic. Throughout, I've said that we should be playing these hands - that doesn't necessarily mean we should be simply calling them (although that's going to be our most frequent play). Many of these hands, and the hands just a little bit worse than them, are really good 3-bet bluff hands, particularly 84s, J5s, 96o, etc. My expectation from 3-betting this range is actually much better than calling, but my sample size is a bit too small to make too much of it. Optimal play is far from settled – see if you can improve on my numbers. Perhaps you already have. At the least, though, we can conclude that folding more is not likely to be the answer.

# Big Blind Play Against a Minraise, 10-15bb deep

*Playing the big blind correctly against opponents who will minraise, limp, openshove, and openfold 10-15 big blinds deep is one of the most difficult (and controversial) theoretical discussions in the endgame of HUSNGs.*

Deeper than that, we have a large sample of flatting with medium strength hands, and we can determine how good those plays are based on the results – makes money, makes sense. However, it is tough to apply the same analysis 10-15bb deep, as pretty much everybody agrees that your flatting frequency should decrease at this stack depth, and thus people do not have nearly the same sample for flatting expectation. How much should we decrease our flatting frequency? How often should we be 3-bet jamming?

The traditional poker theory approach of plugging in ranges and coming up with expectation becomes wildly imprecise at this stack depth. Minraising frequencies go down, which means that the difference between 30% and 40% is massive, compared against the difference between a 50% and a 60% opening range 20bb deep. Futhermore, it is now a bad assumption to believe that a minraising range of 40% is a range that can be approximated by the strongest 40% hands. Good exploitative ranges 12bb deep from the small blind, for example, could potentially mean minraising a polarized range, and openjamming other hands like 66 and A7, which makes it a mistake to include those hands in the button's range for 3-bet jamming calculations.

But enough about the problem being hard: What can we figure out? Well, the first conclusion is that the more frequently your opponent minraises, the less likely you should be to flat. For example, let's play against the following minraising range 13bb deep (the blue lines show his boundaries for minraise/calling:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A A | AxKx | AxQx | AxJx | AxTx | Ax9x | Ax8x | Ax7x | Ax6x | Ax5x | Ax4x | Ax3x | Ax2x |
| AxKy | K K | KxQx | KxJx | KxTx | Kx9x | Kx8x | Kx7x | Kx6x | Kx5x | Kx4x | Kx3x | Kx2x |
| AxQy | KxQy | Q Q | QxJx | QxTx | Qx9x | Qx8x | Qx7x | Qx6x | Qx5x | Qx4x | Qx3x | Qx2x |
| AxJy | KxJy | QxJy | J J | JxTx | Jx9x | Jx8x | Jx7x | Jx6x | Jx5x | Jx4x | Jx3x | Jx2x |
| AxTy | KxTy | QxTy | JxTy | T T | Tx9x | Tx8x | Tx7x | Tx6x | Tx5x | Tx4x | Tx3x | Tx2x |
| Ax9y | Kx9y | Qx9y | Jx9y | Tx9y | 9 9 | 9x8x | 9x7x | 9x6x | 9x5x | 9x4x | 9x3x | 9x2x |
| Ax8y | Kx8y | Qx8y | Jx8y | Tx8y | 9x8y | 8 8 | 8x7x | 8x6x | 8x5x | 8x4x | 8x3x | 8x2x |
| Ax7y | Kx7y | Qx7y | Jx7y | Tx7y | 9x7y | 8x7y | 7 7 | 7x6x | 7x5x | 7x4x | 7x3x | 7x2x |
| Ax6y | Kx6y | Qx6y | Jx6y | Tx6y | 9x6y | 8x6y | 7x6y | 6 6 | 6x5x | 6x4x | 6x3x | 6x2x |
| Ax5y | Kx5y | Qx5y | Jx5y | Tx5y | 9x5y | 8x5y | 7x5y | 6x5y | 5 5 | 5x4x | 5x3x | 5x2x |
| Ax4y | Kx4y | Qx4y | Jx4y | Tx4y | 9x4y | 8x4y | 7x4y | 6x4y | 5x4y | 4 4 | 4x3x | 4x2x |
| Ax3y | Kx3y | Qx3y | Jx3y | Tx3y | 9x3y | 8x3y | 7x3y | 6x3y | 5x3y | 4x3y | 3 3 | 3x2x |
| Ax2y | Kx2y | Qx2y | Jx2y | Tx2y | 9x2y | 8x2y | 7x2y | 6x2y | 5x2y | 4x2y | 3x2y | 2 2 |

This opponent is minraising a pretty wide range for this stack depth, considering he's also limping some middling hands and openjamming some aces and low pocket pairs. In fact, he's managing to play 82% of hands from the small blind – a strong, aggressive strategy. There are some changes I'd make to it as a default play, but if we go up against a player who does play like this, what should our 3-bet jamming range look like?

Before that, let's do a quick exercise. Order these six hands from best expectation to worst expectation from jamming (ignore for a minute the expectation from flatting), and indicate whether or not you would guess that folding is a better option than jamming: Q8o, 54o, J5s, 76s, T9o, and K4o. When you have your answer, keep reading.

These hands play differently than you might think. When we try to come to conclusions about them at this stack depth, we will inevitably use what we know from other stack depths, and not all of them are relevant anymore.

K4o leads the way with -0.25bb from the start of the hand, a full ¾ of a big blind better than folding. K4o is a borderline hand playing against a minraise 20bb deep, but once you get down to 13bb deep, our opponent is actually raise/calling with worse enough of the time that when you add in the fold equity from jamming, mucking is a large mistake against this opponent.

76s (-0.3bb), T9o (-0.4bb), and J5s (-0.5bb) are the next three on the list. 76s is 37% against the calling range, which is not bad at all after fold equity. T9o and J5s similarly do OK. Q8o (-0.6bb) lands at 5th on the list, which will be a surprisingly poor showing to many. The problem is that Q8o, unlike K4o, isn't getting any worse hands to call, but like K4o is dominated frequently, leading to 31.9% equity. Even 54o (-0.75) is not far behind.

Notice that it is actually significantly better to jam 54o here than fold it. While it is not true that any two cards can be jammed (72o is -1.2bb from the start of the hand, where folding is loses us our one big blind), it is very true that against a wide minraising range, we can do a lot of expanded jamming.

Despite some hands performing worse than expected, against this opponent, we should be jamming all six of these hands listed. Q8o is the closest on the list to a flat (you'll have to trust my intuition here), but even that hand is a jam when we're getting a fold 61% of the time. There's just no room for flatting when we have that much fold equity from jamming, with pretty much anything in our range (in fact, the only hands that are correct to flat here are probably aces and kings).

Now let's look at a second opponent, who isn't minraising so much of his junk, again 13bb deep:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A A | AxKx | AxQx | AxJx | AxTx | Ax9x | Ax8x | Ax7x | Ax6x | Ax5x | Ax4x | Ax3x | Ax2x |
| AxKy | K K | KxQx | KxJx | KxTx | Kx9x | Kx8x | Kx7x | Kx6x | Kx5x | Kx4x | Kx3x | Kx2x |
| AxQy | KxQy | Q Q | QxJx | QxTx | Qx9x | Qx8x | Qx7x | Qx6x | Qx5x | Qx4x | Qx3x | Qx2x |
| AxJy | KxJy | QxJy | J J | JxTx | Jx9x | Jx8x | Jx7x | Jx6x | Jx5x | Jx4x | Jx3x | Jx2x |
| AxTy | KxTy | QxTy | JxTy | T T | Tx9x | Tx8x | Tx7x | Tx6x | Tx5x | Tx4x | Tx3x | Tx2x |
| Ax9y | Kx9y | Qx9y | Jx9y | Tx9y | 9 9 | 9x8x | 9x7x | 9x6x | 9x5x | 9x4x | 9x3x | 9x2x |
| Ax8y | Kx8y | Qx8y | Jx8y | Tx8y | 9x8y | 8 8 | 8x7x | 8x6x | 8x5x | 8x4x | 8x3x | 8x2x |
| Ax7y | Kx7y | Qx7y | Jx7y | Tx7y | 9x7y | 8x7y | 7 7 | 7x6x | 7x5x | 7x4x | 7x3x | 7x2x |
| Ax6y | Kx6y | Qx6y | Jx6y | Tx6y | 9x6y | 8x6y | 7x6y | 6 6 | 6x5x | 6x4x | 6x3x | 6x2x |
| Ax5y | Kx5y | Qx5y | Jx5y | Tx5y | 9x5y | 8x5y | 7x5y | 6x5y | 5 5 | 5x4x | 5x3x | 5x2x |
| Ax4y | Kx4y | Qx4y | Jx4y | Tx4y | 9x4y | 8x4y | 7x4y | 6x4y | 5x4y | 4 4 | 4x3x | 4x2x |
| Ax3y | Kx3y | Qx3y | Jx3y | Tx3y | 9x3y | 8x3y | 7x3y | 6x3y | 5x3y | 4x3y | 3 3 | 3x2x |
| Ax2y | Kx2y | Qx2y | Jx2y | Tx2y | 9x2y | 8x2y | 7x2y | 6x2y | 5x2y | 4x2y | 3x2y | 2 2 |

This is a 44.3% minraising range compared against 57.6% in our last simulation. It makes a massive difference in the expectation from jamming. Basically everything goes down around ¾ of a BB in expectation, leaving K4o at -0.95bb, 76s at -1bb (the same as folding), T9o at -1.2bb, J5s at -1.3bb, Q8o at -1.4bb, and 54o at -1.55bb. Against this opponent, wide 3-bet jams are not an option.

There is actually some sexy stuff you can do here against regs who use this polarized raising range, particularly those who minraise more often. For example, take 86s 13bb deep, t390 effective. What happens when you 3-bet to t130? Well, all of that junk is still folding, because you look strong as hell. Suddenly, the weaker hands in that raise/calling range shrink up: Do you really love your life with Q9o? Aren't you tempted to hero fold (it's probably correct against most)? Additionally, you'll get a lot of flats from people with Kx hands they would have called jams with, and you get to jam blank flops and get a decent amount of folds. That often can do much better than jamming; just look at all those hands we improved our expectation against. You do need some pretty good reads about your opponent before this sort of play should be implemented.

As for the main question of flatting vs. jamming, we've hit the key questions of the argument – When jamming is clearly -EV? Is flatting better than folding? These are not questions we can answer with straight numbers. Who am I to tell you what your expectation postflop has to be, given all the creative options available to you that I have never tried? If you can exploit your opponent's postflop tendencies, there's going to be an extra justification for playing pots. In general, though, when flatting is optimal, it will be with middling hands that flop well against an opponent who isn't raising light quite often enough for a jam to be correct.


In conclusion, 10-15bb deep, you need to be hyper-focused on your opponent's button opening behavior. Part of the reason why it is so good to play so many hands from the small blind at this stack depth is that most people are not reactive enough, and do not 3-bet jam (or jam over limps) appropriately. And so, from the big blind, you need to be that reactive. Against a wide minraiser, you should hardly be flatting at all, and against someone who is frequently inducing, you can choose to call with some of your more connecting hands. It is one of the trickiest situations in HUSNG poker – best of luck navigating it.

# Chapter 3: Extensions

## *Correctly Applying "Shove or Fold" Small Blind Endgame Strategy*

*At the end of a HUSNG, your options from the small blind will often quickly come down to two potential decisions: Commit your stack, or fold and wait for another hand. Most players understand the basic concept that when the blinds get high, it is necessary to go all-in preflop with much weaker holdings than you otherwise would. However, people often get confused by how to correctly apply "shove or fold", when it is true that limping and minraise/folding are better options, and how to adjust your jamming ranges versus different opponent types.*

### *When to play Shove or Fold*

When to start shoving or folding exclusively will depend on effective stack sizes and the characteristics of your opponent. There is no magic number of big blinds where it becomes correct to stop limping or minraise/folding, but one good rule of thumb is that once you get deeper than 8bb, the small blind is actually at a disadvantage by only employing all-ins and folds as options. Thus, I strongly recommend searching for other options to maximally exploit your opponent at deeper stack depths. Common adjustments include limping or minraise/folding against opponents who fail to attack these plays preflop or postflop, and minraising (or limping) to induce against opponents who attack these plays too much.

### *Shove or fold below 8bb*

Below 8bb deep, the only situations not to employ a shove-or-fold strategy are when you are playing against opponent types that react extremely poorly versus limps or minraises (generally, this will mean they are playing far too tight). Other than that, shove-or-fold is a very strong strategy. 6bb deep, your opponent is forced to put in 17% of his stack preflop before looking at his cards, while you are only forced to put in 8% of your effective stack in the small blind. That's a large advantage and can be exploited simply by choosing which hands you want to use to force your opponent to go all-in or fold when it's his action.

In general, it is correct to go all-in with a very wide range of hands less than 8bb deep. The NASH chart can help with this decision – 6bb deep, for example, it suggests that the small blind should go all-in with just shy of 70% of hands when playing against an expert opponent. The NASH chart is a good baseline of whether marginal hands are best to go all-in with at this stack depth, but in order to make the most money, you should alter your shoving range based on your opponent type. For example, NASH suggests that when two expert opponents are playing each other, the big blind will call an all-in with 98o at that 6bb stack depth. However, we have all played against opponents who we know are so tight that they would never even dream of committing all the chips with just nine high. Thus, it can be correct to shove up to any two cards at this stack depth against very tight opponents.

Against opponents who are very loose and just want to gamble when blinds get high, it is important to adjust your jamming range accordingly as well. NASH recommends jamming a hand like 86o up to 7bb deep, but part of the calculation comes from expecting hands like 87, 97, 98, T8, T7, J7, J6, and 87s all to fold to an all-in that deep. If you believe your opponent is likely calling all of those hands, don't feel compelled to blindly follow NASH, as a slightly tighter jamming range will do better against this opponent type. Don't overdo it, though – remember that weak high card hands, like Q4o (which NASH recommends jamming at 7.9bb), become even stronger if your opponent is calling with a lot of worse trash. The main hands that are devalued are low connector cards that rely mainly on fold equity to be +EV all-ins.

## *Shove or fold above 8bb*

The biggest, most prevalent misconception about shove-or-fold from the small blind is that the NASH chart always guarantees you won't have negative expectation. People are fooled by the word "unexploitable", which means something different in game theory than "guaranteed not to lose money". If you are one of many who has not heard this before, take a step back and think about it: Surely, there is some stack depth where going all-in or folding with a perfect range is not guaranteed to make you money. What would you think of an opponent who did nothing but either go all-in or fold 50bb? Do you think you'd have an edge? As it turns out, the big blind has the edge all the way down to around 8bb if the small blind sticks to an exclusive shove-or-fold strategy. Therefore, above this stack depth, it is important to know how to open up your playbook. Use the minraise to induce and to attempt to get folds more cheaply. Use the limp against opponents who are either too aggressive against limps or not aggressive enough (very often, it will be the latter). While the true game theory optimal strategy of HUSNGs is difficult to solve for, most people assume that such a solution, after allowing the small blind to limp or minraise, would show that the small blind has the edge again at all stack depths.

Still, there are hands that are still easily best to go all-in with above 8bb. Small pairs and weak Ax, for example, often play extremely poorly by minraising or limping, and all-in is generally the best option with those even up to 15bb. Don't be too scared to go all-in with these type of hands: Chubukov charts, which we'll tear apart later in this section, show that your expectation with these types of holdings can be very good, no matter what range your opponent calls with. If your opponent rarely jams over a minraise or calls all-in shoves very loosely, it is often correct to still openjam with your strongest hands (like AK), as well.


| | A | K | Q | J | T | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ |
| K | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 19.9 | 19.3 |
| Q | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 16.3 | 13.5 | 12.7 |
| J | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 18.6 | 14.7 | 13.5 | 10.6 | 8.5 |
| T | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 11.9 | 10.5 | 7.7 | 6.5 |
| 9 | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 20+ | 14.4 | 6.9 | 4.9 | 3.7 |
| 8 | 20+ | 18 | 13 | 13.3 | 17.5 | 20+ | 20+ | 20+ | 20+ | 18.8 | 10.1 | 2.7 | 2.5 |
| 7 | 20+ | 16.1 | 10.3 | 8.5 | 9 | 10.8 | 14.7 | 20+ | 20+ | 20+ | 13.9 | 2.5 | 2.1 |
| 6 | 20+ | 15.1 | 9.6 | 6.5 | 5.7 | 5.2 | 7 | 10.7 | 20+ | 20+ | 16.3 | * | 2 |
| 5 | 20+ | 14.2 | 8.9 | 6 | 4.1 | 3.5 | 3 | 2.6 | 2.4 | 20+ | 20+ | ** | 2 |
| 4 | 20+ | 13.1 | 7.9 | 5.4 | 3.8 | 2.7 | 2.3 | 2.1 | 2 | 2.1 | 20+ | *** | 1.8 |
| 3 | 20+ | 12.2 | 7.5 | 5 | 3.4 | 2.5 | 1.9 | 1.8 | 1.7 | 1.8 | 1.6 | 20+ | 1.7 |
| 2 | 20+ | 11.6 | 7 | 4.6 | 2.9 | 2.2 | 1.8 | 1.6 | 1.5 | 1.5 | 1.4 | 1.4 | 20+ |

One common strategy adjustment away from shove-or-fold above 8bb deep is to start minraising a balanced range. Combine junk hands you'll fold against an all-in and with dominating hands that crush a wide 3-bet shoving range. For example, a hand like KJ has very strong equity against a lot of 3-bet shoving hands, like J9s. By minraising, you can do much better inducing worse hands to get it all-in than you can by simply jamming yourself. However, as alluded to, a hand like A2o might do much worse with this strategy – you'd actually rather your opponent with J9s fold to a shove than go all-in against you 10bb, because it has over 47% equity against you, and it's a disaster when that hand chooses to just call a minraise because of how well it will play postflop against your Ace-rag.

Therefore, above 8bb, it's generally best to employ a mixed strategy that exploits your opponent's tendencies and makes better use of the properties of different hands in your range.

## *Conclusion:*

In HUSNGs, the endgame can be a frustrating process that feels like pure gambling. However, when done correctly, there are a myriad of different strategy adjustments that help you maximize your expectation, and crush people who think the endgame is all about flipping and following charts. Learning when and how to employ shove-or-fold will make you more confident you have edge, even when stacks get short.

# Small Blind Play 11-14bb Deep: Raise, Openshove, Fold, or Limp?

*In the last article, we described the best approach above 8bb from the small blind as making use of the ability to limp, minraise/call, and minraise/fold. Let's go into a bit more depth about those decisions and talk about how you can use data to maximize your expectation at this stack depth.*

When we are 12bb deep, I estimate that a random opponent will call an openshove with around the range of [22+, A2+, K8o+, K6s+, QJo, Q9s+]. Certainly, there are some opponents who will call with K7o, K5s, QTo, and Q8s, if not even wider. Similarly, there are opponents who would fold K8o, K6s, QJo, and Q9s for 12bb, if not even tighter. Still, from 25,000 games of experience, this is my best guess at a standard villain calling range at this stack depth. When looking at openshoving, the question NASH asks is "how deep can I jam in equilibrium so that going all-in is better than folding?". However, with the vast majority of hands that we might consider going all-in with 11-14bb deep, folding is rarely an option. When we have T7s, Q8o, J9s, 98o, 54s, and those type of borderline hands, if we decide not to go all-in, limping or minraising will likely be what we choose instead – not folding. Because of that, looking at a NASH chart can be a pretty poor approximation above 8bb.

NASH tells us that jamming is better than folding with 87o up to 14.7bb deep in shove-or-fold equilibrium , but does this mean we should actually go all-in with 87o that deep? The most important piece of missing information has to do with our expectation from minraising and limping. Luckily, after all those games I bragged about having under my belt in the last paragraph, I have developed a strong sample of results to lean on. Historically, my expectation from limping and minraising marginal hands around 12bb deep has been much stronger than folding – in general, it lies between +0.1bb/hand and -0.2bb/hand for most holdings, with folding the small blind resulting in -0.5bb/hand. While an average does not encapsulate all of the different opponent tendencies we could be playing against, especially given that if I am at all decent at poker, my sample should be biased towards opponents where making this play has better expectation than usual, it does illustrate the point of how bad a comparison the expectation of folding is and give us a different benchmark to evaluate the EV of going all-in against.

## The ~12bb Small Blind Cheatsheet

*Readless ranges for the beginning ROFLer.*

| | A | K | Q | J | T | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | +2.8 | +1.7 | +1.5 | +1.4 | +1.2 | +1.0 | +0.8 | +0.7 | +0.6 | +0.6 | +0.5 | +0.4 | +0.4 | |
| K | +1.6 | +2.3 | +0.7 | +0.6 | +0.4 | +0.3 | +0.1 | 0EV | 0EV | -0.1 | -0.1 | -0.2 | -0.2 | |
| Q | +1.4 | +0.5 | +2.1 | +0.2 | +0.2 | 0EV | -0.1 | -0.2 | -0.2 | -0.2 | -0.3 | -0.3 | -0.4 | Raise/Call |
| J | +1.2 | +0.4 | 0EV | +1.9 | +0.2 | 0EV | -0.1 | -0.2 | -0.2 | -0.3 | -0.3 | -0.4 | -0.4 | |
| T | +1.1 | +0.2 | -0.1 | 0EV | +1.7 | +0.1 | 0EV | -0.1 | -0.2 | -0.3 | -0.3 | -0.4 | -0.4 | Openshove |
| 9 | +0.8 | 0EV | -0.2 | -0.2 | -0.1 | +1.5 | 0EV | -0.1 | -0.2 | -0.3 | -0.4 | -0.4 | -0.5 | |
| 8 | +0.7 | -0.2 | -0.3 | -0.3 | -0.3 | -0.2 | +1.3 | 0EV | -0.1 | -0.2 | -0.4 | -0.5 | -0.5 | Limp |
| 7 | +0.5 | -0.3 | -0.4 | -0.4 | -0.3 | -0.3 | -0.3 | +1.1 | -0.1 | -0.2 | -0.3 | -0.4 | -0.6 | |
| 6 | +0.4 | -0.3 | -0.4 | -0.5 | -0.5 | -0.4 | -0.4 | -0.3 | +1.0 | -0.1 | -0.2 | -0.4 | -0.5 | Raise/Fold |
| 5 | +0.4 | -0.3 | -0.5 | -0.5 | -0.6 | -0.5 | -0.5 | -0.4 | -0.4 | +0.8 | -0.2 | -0.3 | -0.5 | |
| 4 | +0.3 | -0.4 | -0.5 | -0.6 | -0.6 | -0.7 | -0.6 | -0.6 | -0.5 | -0.4 | +0.7 | -0.4 | -0.5 | Openfold |
| 3 | +0.2 | -0.4 | -0.6 | -0.6 | -0.7 | -0.7 | -0.7 | -0.7 | -0.6 | -0.6 | -0.6 | +0.5 | -0.5 | |
| 2 | +0.2 | -0.5 | -0.6 | -0.7 | -0.7 | -0.7 | -0.8 | -0.8 | -0.8 | -0.7 | -0.8 | -0.8 | +0.3 | |

*So when do we jam and when do we do something else?* To help us in answering this question, I have made a table. It shows the expectation of openshoving with each hand 12bb deep against this calling range. 0EV means that if we start the hand with 12bb, our expectation is to end the hand with 12bb. -0.5bb means that if we start the hand with 12bb, our expectation is to end the hand with 11.5bb. **Since that is what happens when we fold, -0.5bb is the same thing as openfolding in this framework.** It also gives some example recommendations of what to do with these hands in light of this information.

Let's do a quick Q&A:

## *1. Wow! This looks so cool. Is it a new equilibrium? Is it balanced?*

Some aspects of our range are definitely balanced – our minraising range, for example, despite having all of our monsters, also has a ton of junk in it. Similarly, while the openjamming range has a lot of suited connectors in it, it also has a good amount of Ax and pocket pairs. The biggest thing that makes this not close to an equilibrium is our limping range – it's all stuff that's folding to a shove. That's obviously highly exploitable. However, remember one of the most important axioms of poker: If you want to exploit your opponent, you have to be exploitable. Maximum money comes from exploitable strategies. Force your opponent to adjust and start jamming over your limps wide, and then re-adjust in response to that. Notably, though, this strategy only calls for limping once every 6 buttons or so – your opponent is unlikely to feel like he's getting limped to death.

## *2. Why are some hands openshoves and other hands limps or minraise/calls, despite having the exact same expectation when jamming?*

54s and K2s are very different hands than J7s and Q9o, despite having the same expectation when going all-in. The latter duo plays much better in limped pots, whereas K2s and 54s don't have the luxury of that alternative. It all goes back to the main point: We should compare the expectation of plays against the expectation of the next best option. That's why looking to NASH for most of these decisions can lead you astray.

## *3. Are you sure about these ranges as standard? I would play a certain hand differently readless. Am I wrong?*

No, you're not categorically wrong. I made this table six months ago and have changed my mind about a lot of hands since then. There is a lot of wiggle room for a lot of these hands – if you want to limp JTo or minraise/fold 95s, I would not argue too strenuously with you (in fact, I would probably agree on both cases now). However, if you think openjamming K3o, Q2s, or 97o is best readless 12bb deep, there are strong reasons to believe it is not (despite NASH's advice to jam). There are actually always right and wrong answers, but we should care most about the ones that are clearly right and clearly wrong. For example, if you think limping with 53s is best readless instead of investing the extra big blind in hopes of a fold, I would strongly disagree with that conclusion.

*4. Are you sure the openjamming range isn't too weak? It seems like there are a lot of weak hands in that range and no big hands. Can't our opponent exploit us by calling wider?*

It is a little weak – the big blind is correct to open up his calling range wider in response to this jamming range. That is actually what you will see a lot of at the nosebleeds – people call openshoves pretty wide 11-14bb deep because of the ranges they represent. If you feel like your opponent has picked up on how much you are exploiting his calling range and starts to open up, there is one pretty easy adjustment you can make: Start openjamming your strong Ax hands as well. Those hands have rather mediocre inducing value especially considering that the big blind's expanded playing range will rarely be dominated, and the value from openjamming goes way up if your opponent is calling jams wide.

*5. It seems like a bunch of small differences. Are you sure this even really matters that much? Aren't there more important things to be worrying about?*

Keep in mind that NASH is -EV against the NASH calling range from this stack depth. People should still have positive expectation using most strategies, but I think my expectation using this type of approach has been exceptionally good. In my $100,000 month, my EV adjusted winnings from the small blind 10-15bb deep were $27,000. Lifetime, my EV has been 8bb/100 over a huge sample. I am not sure what numbers other players are accomplishing, but I think those make for some pretty strong proof that the expectation from having ranges like this can be really good.

It all goes back to the Ed Miller article about meaningful errors – sure, it can be hard to get motivated about improving in certain situations by 0.2 big blinds. However, because these situations constantly come up in endgame play, your leaks get magnified over time, and you lose a lot of money by not playing optimally.

*6. How does your approach change as stack depths get shorter?*

The expectation of your marginal hands goes up significantly and your opponent will jam wider over limps, so more hands become openshoves. You can and should still limp hands that have mediocre jamming expectation but play decently postflop, such as Q5o, T7o, and J7o 10bb deep. In general, people are willing to get it in wider from the big blind, so minraise/folding becomes less attractive as well, although I think you absolutely should have a minraise/folding range against most opponents 10bb deep. Getting flatted becomes an even worse proposition with more Ax hands, so those hands can become openshoves as well. Basically, the ranges squeeze tighter and start to more closely approximate the shove or fold equilibrium that is +EV for the small blind 8bb deep or less.

*7. How does your approach change as stack depths get deeper?*

Against opponents who 3-bet jam appropriately wide, 15bb can be a great stack depth for limping, given how much the big blind has to risk to jam over them. More hands on the openshove list become limps or raise/folds. The better the hand flops, the more likely it is to be a limp. T7s, for example, is a great hand to limp 15bb deep. Some hands that were strong enough to raise/call, like K7o, aren't strong enough against most opponents anymore, and become limps or minraise/folds. Low Ax and weak pocket pairs are still great jamming hands even 15bb deep. Against players who are not willing to reshove wide, it is important to keep pounding your opponent with minraises and not get too limp happy. Just because it feels less fun to minraise/fold 98s does not mean that you should not do it if your opponent is 3-bet jamming infrequently.

Throughout all this advice, keep your attention on the foundations that we've previously outlined. There are no charts to follow to maximize your expectation – doing so will depend on how well you react to the tendencies of your opponents and how willing you are to think through games rather than autopilot them. All that said, there is a massive opportunity for significant edge in the endgame if you make the most of the options of minraising, openshoving, folding, and limping.

# Chubukov: How it Helps, and How it Doesn't

***Sklanksy-Chubukov*** is an endgame table that tells you the deepest you can jam a hand from the small blind and still be sure your expectation is better than folding. That sounds like something useful to have in your arsenal, but hidden in that explanation is the fact that to be sure you have better expectation from going all-in than folding, you have to evaluate the expectation from jamming as if your opponent plays perfectly against your all-in, as if you accidentally flipped over your cards (or are playing on Ultimate Bet), and your opponent knows what you have. That means if you go all in with 87s, your opponent will fold 76s, but call with 92o. This means that Chubukov provides some useful information, and a lot of useless information.

The biggest mistake players make when learning about Chubukov is treating it as a strategy to employ against certain opponents. Chubukov is meant to be information, not a strategy. When we ask Chubukov whether we are guaranteed to be +EV when we go all-in for 8bb with 98s, the answer will be "no", but that says close to nothing about whether 98s is actually a good enough hand to go all-in with at this stack depth.

Chubukov is not a strategy. It tells you that 98s is a jam for sure up to 7.7bb, and then expects you, the human, to be smart enough to know that because 98s is a hand in which opponents play drastically different against you than they would if they didn't know your hand, that this information is not particularly useful. Against the vast majority of opponents, even those with very loose calling ranges, 98s is an easy all-in for ten big blinds.

So, what is Chubukov? I think the best way to think about it is that Chubukov is the first thing to check to see if you are being way too conservative with your weak Ax, Kx, Qx, and low pocket pair hands from the button. While the information for 54s is fairly useless (we are to assume our opponent is calling with 62o?), there are reduced problems with assuming a perfect calling range for those types of holdings.

To illustrate this point, here is a quick quiz. We're playing against an opponent who jams fairly wide over limps and minraises, but not so wide that we feel like limp/calling or minraise/calling is the best option. For each of the following situations, consider going all-in from the button. Is this play:

*A) Guaranteed to be better than folding, or*
*B) Depending on our opponent's calling range, possible to be -EV when compared with folding?*

*1. 22 24bb deep*
*2. Q5o 7.5bb deep*
*3. Q2s 8bb deep*
*4. K3o 10bb deep*
*5. K3s 14bb deep*
*6. A2o 22bb deep*

The answer to the six questions is that they are all guaranteed to be +EV jams. If you ever openfold K3o at 10bb or Q5o at 7.5bb, you're losing money in that hand compared against openshoving, period, no matter how loose or tight or downright weird his calling range is. That is useful information. Sometimes we know our opponent is calling looser than NASH, but NASH doesn't tell us if we can still jam our hand and be +EV despite that. Chubukov is a quick place to check to confirm that yes, in fact, just because your opponent is playing oddly and you can just feel yourself about to be snapped off by Q6o 7.5bb deep, you should still go all-in with Q5o. The power of your queen high makes it so even if your hand was flipped up, it is still good enough to go all-in with.

However, we still need a couple of caveats. The reverse is not true – if Chubukov says that we cannot profitably go all-in if our opponent knows our cards, that does not answer the question of what to do given that he does not. Basically, Chubukov is just a "sanity check" for when you are playing against a loose opponent and even though NASH says it's a jam, you are not sure against his calling range. In this case, Chubukov can restore your sanity by saying "yes", but when it says "no", you have to use your human brain to make the decision. Additionally, remember that comparing to folding is often a metric that is too generous. In the above examples, going all-in is better than folding with A2o 22bb deep, but in reality, A2o is only an openjam up to around 15bb. This is because the best comparison with A2o is minraising deeper than 15bb, where our expectation will be significantly better than -0.5bb from folding.

Chubukov tells you that you can always shove K3o for 10bb and do better than folding, even against an opponent with a crazy calling range. It tells you that the same is true for Q2s at 8bb, and Ax hands way above any stack depth you would consider going all-in for. Take these insights, and if you start to get confused about the rest, it is probably best to leave it behind and focus on studying that actually gives good insight into better strategic adjustments.

## Population tendencies and the moving target

*From David Sklansky's The Theory of Poker, the fundamental theorem of poker can be paraphrased as such: "Every time you play a hand differently from the way you would have played it if you could see your opponent's cards, you lose out on EV".*

This is perfectly correct, but given that we are not all superusers who can tell the one time our opponent is openjamming aces for 10bb into our kings (and we make an "error" by calling), we can also think about a different version of this theorem: One that concerns ranges. Every time you play a hand differently from the way you would have played it if you knew your opponent's ranges, you lose out on EV.
This perspective helps showcase two very important concepts. Firstly, guessing ranges as close as possible is essential in playing good poker. Secondly, using different ranges than your opponent thinks you are is extremely valuable. Both of those points seem fairly obvious on the surface, but there are key insights in the details.

Population tendencies is the term I use to mean the average frequencies of a certain group of opponents. Two common such groups are "screennames I have heard of", and "screennames I have not heard of". The first hand of the match, your best guess of your opponent's ranges is the aggregate frequencies of one of these groups, based on whether you recognize the name or not (you may elect to make other adjustments based on things like your opponent's country of origin and whether the avatar is a small child, but let's set those aside). All you can do, ever, in poker, is make the best guess of your opponent's ranges given the information that you have available to you. If you play the exact same way for the first ten hands against a screenname you have heard of as you would against a screenname you haven't heard of, you'll often miss out on EV. It doesn't matter that there are a wide variety of different player types in both groups. Because there are things that known players do more or less often than unknown players, if you stick to a static strategy, you're not making the best guess you can about their ranges, and you lose out on EV.

Our readless decisions are based on population tendencies. Data suggests that A4o is a flat first hand against a minraise 25bb deep against an unknown opponent at mid-stakes – the average opponent is not opening a range of hands that is wide enough for jamming to be better than flatting. When we get more information, we still have to base our guess of what our opponent's ranges are on some combination of what we've seen and what most people do. As your sample size increases, so does your weighting on what you've seen against this particular opponent, especially if that range doesn't seem to be remaining constant over time.

Some of the correct responses to these population frequencies are highly exploitable. As mentioned previously, one example of this is the fact that most players barrel off very infrequently on dry boards – far less than is correct in equilibrium between game theory optimal players. Because of this population tendency, the correct response is to assume double and triple barrels are strongly weighted toward value, and to fold middle pair and weak top pair hands, which is what makes it such a profitable barreling opportunity. Your opponent is playing differently than he would if he knew your ranges, and he's losing out on EV because of it.

The big idea here is that there's actually nothing your opponent can or should do about this readless. It is optimal for him to start the match against you being highly exploitable against ranges that are different than the population tendencies. It is optimal for him to get owned by your exploitative tactics. Sure, after a while, your opponent will catch on, and change his frequencies, but you can be a moving target and change yours in response.

This concept is rampant in HUSNGs, especially against thinking players. Ever try making a small, non-all-in 3-bet as a bluff against a wide minraiser 15bb deep? It is often wildly profitable, because the population tendency is for that bet to be super strong. Similarly, try making triple barrels with the turn bet being too small to get many folds – you'll get a ton of river folds here from villains who correctly know that in general, most players don't bluff with sizes that won't get many folds, and this line is quite strong. More generally, most players don't check/raise dry flops anywhere close to the equilibrium frequency, and you can gain against good players who are playing exploitably (remember, also optimally!), correctly focusing on what has the best expectation against population tendencies.

*"The more static your frequencies are, the easier it is for your opponent to hone in on your strategy"*

Some of this edge goes away when players put you in the "player who has a clue" bucket instead of the "general population" bucket. That said, there still exists massive opportunity here. Optimal ranges against the population of regular opponents are still wildly exploitable, and you can still take advantage of it if you think in the framework of the fundamental theorem of poker for ranges.

It is worth stopping to make a couple of clarifications. First of all, it is not enough for your opponent to be playing suboptimally – you have to have better expectation than you had before. You can only go all-in with aces and laugh whenever your opponent calls with a non-AA hand because he's not playing optimally against your ranges, but regardless, your opponent is suboptimal but also still +EV. Secondly, the opportunity doesn't stop when your opponent figures out to stop considering everybody else's tendencies and just try to hone in on yours. That's when the game really gets going.

The more static your frequencies are, the easier it is for your opponent to hone in on your strategy and make fewer and fewer errors, playing hands exactly as he would if he knew your ranges (because he does, in fact, know them pretty well). Your opponent will make more and more mistakes the more uncertain he is about your ranges in any given segment of a match. You can continuously gain by exploiting villain frequencies that are out of whack from equilibrium, and exploiting the other way when your opponent over-corrects. Ever get that special kind of rage tilt when it feels like an expert opponent is 3-betting a high percentage, and every single time you jam a weak ace you run into kings? This can of course be purely bad luck, but it also can be manipulating perceived frequencies and getting you to believe in a different range than is actually there.

In short, take advantage of what non-equilibrium ranges people expect to face by exploiting the typical response. Your opponent's optimal play is exploitable. When your opponent start's honing in to your non-equilibrium frequencies, be a moving target, and keep causing your opponent to play against the wrong ranges.

# Underbetting and Overbetting: Theory

As people were learning HUSNGs, a general consensus arose that bets should tend to be between half the size of the pot and the full size of the pot. That works as a good rule approximation for most situations, and keeps your moron roommate from dumping too much at the $2 games during an ill-advised microstakes backing agreement. However, there's nothing mathematically magical about that half pot number, or that full pot number. In fact, there are plenty of situations where betting smaller or bigger is theoretically much better. The reason for this is not derived from gimmicks or "soulreading" by making your opponent guess wrong. It comes from something somewhat less sexy – the math.

*Here's what an overbet and an underbet says to your opponent, when used appropriately:*

***Underbetting:*** My range is stronger than yours, but I have plenty of complete air, too. Your range is full of total garbage, and we both know it. I'm going to bet small: ***What are you going to do about it?***

***Overbetting:*** My range is stronger than yours, but I have plenty of bluffs, too. Your range is full of mediocre bluffcatchers, and we both know it. I'm going to bet big: ***What are you going to do about it?***

The key difference is the composition of your opponent's range. It is weak in both cases, but in one, the weakness consists of total air hands that will need to be folded even to a small bet. In the other, the weakness consists of plenty of mediocre hands that can call small bets, but are forced to make massive hero calls against big bets. Our range remains fairly consistent: More monsters than our opponent, but also a good amount of air that is looking to steal the pot as effectively as possible.

We'll go more into detail about underbetting and overbetting HUSNG examples in the next two articles, but it's worth noting that this characterization is widely applicable throughout most poker games. In MTTs, we often make small 3-bets (and 4bets, and 5bets…) because it represents a strong range, our opponent has plenty of weaker hands that still have to fold despite the size, and it doesn't really matter that we too can have plenty of garbage hands. "What are you going to do about it?" is exactly what we're asking. That's also why open raise sizes in MTTs went from being 3x or even 3.5x down to 2-2.2x as the game evolved. "I'm opening the pot. I have a stronger range than you do. What are you going to do about it?" The smaller size allows you to contest more pots and risk less while doing so.

As for overbetting, you probably know that feeling of getting ready to call a bet with a marginal holding, and raising your arms in frustration as a much bigger bet comes your way, having no idea what to do now. The bigger the size of the bet, the more often the bluffcatcher needs to be good for his call to be correct, which means that the bettor can include more and more bluffs and win the pot with air more and more often. An overbet from a player with both monsters and air in his range, when you rarely have a very strong holding, is a nightmare for even the best of players, as you can see by the ribbing that Tom Dwan will occasionally get for developing a reputation of getting abused by bets larger than the size of the pot.

Overbetting and underbetting have strong foundations in unexploitability in these situations, but that doesn't mean you have to be balanced – most of the time, you don't want to be. You want to be using your bet sizings to further exploit your opponent and get the result you want from the hand you have at the time. Sometimes you underbet only when you have a bluff, because your opponent just does not have the stones to raise without a hand himself, and you might as well get full value when you have it and get off as cheaply as possible when you don't. Sometimes you underbet only when you have a value hand, because your opponent just can't help himself and will be constantly induced, so you make a small bet for value when you have it, and advertise a more "normal" bet when you don't. The same goes for overbetting. Some opponents love to make those hero calls with bluffcatchers, and some wouldn't dream of it. Don't worry much about unexploitability against opponents who are just begging to get exploited with their approach to the game.

## Underbetting in Practice

*With that theoretical base, we can look at some more specific examples. Here are five rapid fire hands with underbetting implications:*

*Hand 1:* We raise the button and get called. Flop is A72 with two spades and we continuation bet 1/3 of the pot.

*Hand 2*: We raise the button with A2 and get called. Flop is Q55. We c-bet 1/3 of the pot.

*Hand 3*: We 3-bet from the big blind, and the flop comes K52 rainbow. There is now 400 in the pot with 700 effective stacks behind. We continuation bet t150, or 37.5% of the pot.

*Hand 4:* We minraise the button 32bb deep. The flop comes A95 rainbow. Our opponent, who we know is capable of doing this with a wide range including middle and button pair, leads out for half the pot. We make a small raise to t90, and get called. The turn is a 2, and with t260 in the pot and t490 behind, we bet t95. When called, we jam t395 into t450 on the river.

*Hand 5:* We minraise the button. Flop comes Q62 with two spades. We continuation bet, and our opponent check/raises. We either make a small 3-bet back, or call and underbet the turn.

Starting with Hand 1. Here, it is often good to underbet as a continuation bet because we have a stronger range and are in position. Our opponent's range contains a lot of air, and people tend to be fairly fit or fold on this flop. Thus, underbetting gives us a cheaper price to win the hand which adds up over time. It is also worth noting that we are not done with the hand if we get called. Most opponents who just call a small flop bet here have a rather weak range, even after they indicate that they do not have a hand in their substantial air range. Betting the flop this way is a good method of getting information about your opponent's holdings even when called, and because you represent an inducing hand well on the flop you can follow through with some very profitable bluffs.

In the second hand, we have a specific holding where there's really no need to make a full-sized continuation bet against the vast majority of opponents. We want to continuation bet here to not give our opponent free cards to realize his 25% equity (with JTo in the big blind, you're hoping you don't have to face a c-bet). We'll also get some thin value from king high and floats. There's no need to bet a full half pot to accomplish these things, especially the folding out equity we'll never get value from, which is the case the majority of the time here. So bet 1/3 of the pot and ask your opponent what he's going to do about it. Most of the time, the answer is nothing.

In the third hand, we have some 3-bet bluffs in our range but also clearly a stronger set of holdings than our opponent. There is no need to ever bet half pot here on the flop unless it is to exploit some tendency you have observed. There is no threat of losing out on money with our value hands, our opponent pretty much has to just decide whether to get it in or not. A size even as low as t90 may actually be best on this flop – there's just so much air in the button's range and no issues with losing out on value with a smaller bet.

In the fourth hand, we do not need to bet big on the turn to eventually get the fold equity we are looking for. The small flop raise and turn bet represents value hands super well, and makes for a very credible river jam. I usually take this line exclusively for value against non-thinking players, far more weighted to bluffs against thinking-but-nitty villains, and with a balanced range against the best opponents. Underbets can be used to serve whatever purpose you are trying to accomplish against your specific opponent.

In the last hand, our opponent represents a strong range by check/raising, but most good players will have plenty of air in it. We can represent an even stronger range, and the best way to do that is to click it back. We can also choose to represent a range of more moderate strength by calling, and then follow up on that with a small turn bet when checked to – very often optimal with hands that would call the check/raise, and a very profitable bluff line against opponents who like to check/raise the flop light but give up when caught.

In all of these examples, a smaller betting amount is actually better than a big one at putting our opponent to the test with our entire range. There are also some common themes in these examples other than what I mentioned at the start of the article. The flops I am using for these hands tend to be dry – the more often your opponent has a weak pair or gutshot, the more you can play into what your opponent wants by making the price to continue cheap, especially if you do not follow up on future streets. The stack sizes tend to be shorter – we do want to get full value from our value range, and that is why underbetting is more effective with our entire range at shorter stacks. In heads-up cash, good players do not continuation bet less than half pot on a dry board (and usually 2/3) against other decent players for a few other reasons (people call less wide from the BB due to the stack size, for example), but also because you need to be able to leverage your stack in position. That becomes less of a factor the shorter we get.

Underbetting is a great way both to be exploitative when appropriate and to stay balanced if you need to. Probably the biggest benefit is that players tend to be terrible at adjusting to it when used in the right situations. It can induce and lead to a lot of spew, and can also just print money against uncreative opponents who are too hesitant to get out of the box. Keep thinking about how to use it appropriately.

# Overbetting in Practice

Spending six weeks at our World Series of Poker house in Las Vegas was a lot of fun, and not just because of the fact that we had water polo nets and there seemed to always be a game of Chinese Poker that needed one more player. It also was an incredibly interesting immersion into good poker theory with some excellent thinkers of the game. Probably my favorite experience in that regard was watching a nosebleed HU cash player, who has logged many matches against durrrr, jungleman, and other heads up legends, play four tables of heads up cash online against another housemate. For 20 minutes, I sat on one side of the (actual) table, before getting up and seeing the action from the other side for a while. The match left a lot to talk about, but this article will focus on a specific example of overbetting: The out of position caller leading the turn for more than the size of the pot after the flop is checked through. This play is an example of how to identify good situations to overbet, both for equilibrium and exploitative reasons.

Let's take a drawy flop: QJ8 with a flush draw. What does your checking behind range on this texture look like? For most people, myself included, it includes air hands that decide to give up, ace high and king high hands that believe continuation betting has worse expectation, and marginal showdown value hands with pairs, like 8x or maybe Jx, One of the reasons you might decide to check behind a hand like J7 on this flop is that you can very comfortably call a normal sized turn lead on a blank. Instead, though, imagine that your opponent leads for 1.5x the size of the pot against your checking behind range on this flop, which very rarely has a big hand in it. Don't you hate your life with J7? If you call one street, don't you hate your life even more when you face a sizable bet again on the river?

Going back to the theoretical fundamentals, we find a perfect "what are you going to do about it?" basis for overbetting in this spot. The big blind has plenty of air, but also way more big hands than the small blind, which would have bet strong hands on the flop. The small blind is stuck with a bunch of marginal holdings that feel sick when having to deal with a large bet against a range with so many strong hands in it. It turns out that sickness is completely theoretically justified.

I always advise that if you are afraid of getting pushed around, either one of the following two things is going to be true:

*1) Your opponent isn't bluffing you that often, so you shouldn't worry about getting pushed around so much, because it doesn't happen that often of the time.*

*2) Your opponent is bluffing you that often, so you get to just click call, obviously.*

When you put it that way, this situation doesn't seem that scary from the button's perspective. However, the problem is that the big blind also has so many value hands in his range. QJ/Q8/J8/T9/combo draws/Qx in general are all too happy to get maximum value by overbetting into an opponent who is inclined to make hero calls. All of those value hands are what allows an overbet to be made with so many bluff hands without becoming exploitable.

OK, so what can the button do about this strategy? Well, one option is to start checking behind on the flop with big hands – overpairs, two pair, the straight, strong Qx, ace high flush draws, and all these types of holdings. However, this can lead to some horrific side-effects. On this board, there are many turn cards that kill action, often a disastrous result. It is also a very bad outcome when checking allows the big blind to realize his equity for free. To give up on a c-betting situation like this, the button has to know it is getting a ton of value on the turn by checking behind, but if the big blind is only overbetting the turn a third of the time or so, checking back flops is a big gamble to take for an induce that usually does not even work.

The key point here is that sometimes it is worth it to have unbalanced ranges, and this is one of those occasions from the button's perspective. It does not help enough to check behind big hands on this flop, even if the big blind is occasionally overbetting on the turn when this happens. The button can choose to try to balance the ranges, or choose to leave the checking behind range capped (or mostly capped), and either is a good result for the big blind. The only bad outcome for the big blind is if the small blind leaves his ranges capped and exploitable, but the big blind fails to follow through and attack. Too often, that is actually the default play.

This example can be used to illustrate both balanced and exploitative overbetting:

## *A balanced range:*

*On this flop and turn, a balanced overbetting range from out of position could be composed of the following:*

**Value: QJ/QT/Q9/Q8/J8/9T**
**Bluff: All weak flush draws/any gutshot/some Kx**

This is a fairly value-oriented range, but even if our opponent were to fold every time, it means that we win the pot every time we have T7, every time we have K4, every time we have a baby flush draw, every time we have 96...it's a lot of hands that we get to win with because of how our overbet forces our opponent to fold his middle pair. And if he decides to hero call, well then great, we have plenty of stuff that benefits in a big way from a curious opponent. This strategy is extremely difficult to play against over time, even if our opponent is competent enough to see what is going on.

## *To exploit:*

However, against most opponents you will face, as usual, you should not be trying to be unexploitable, you should be trying to be exploitative, which by definition is exploitable. That means using overbetting in an unbalanced way, taking advantage of their strategies and their frequencies. Against many opponents, it's correct to overbet with your weak flush draws/gutshots/Kx, because they would always fold middle pair against such a strong bet, and bet smaller with the nuts and other strong hands, because it gets max value against that same middle pair. Against others, who love to make big hero calls, it's correct to bet smaller with bluff hands just to fold out air, and bigger with value to take advantage of excessive curiosity. Whatever it is, wait until your opponent figures you out, and then if he does, you can always switch your frequencies up and remain a moving target, even exploiting your opponent's adjustments. The surprising truth is that most opponents will often fail to adjust for a long time.

## *Calculating pot odds and how often your opponent needs to fold to your bluff*

After all of that more advanced discussion, let's backtrack and make sure you have some of the basics down. Pot odds and figuring out how often you need to get a fold are not as complex of expectation calculations, but they are still important to be able to do, and quickly.

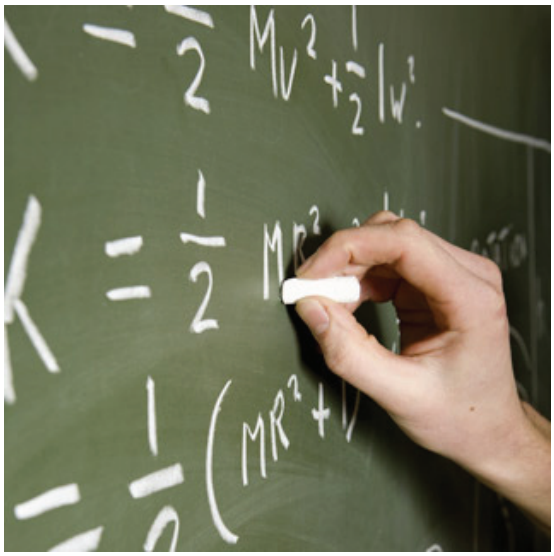
### *Calculating how often you need a river call to be good for it to be better than folding:*

Your pot odds are the amount you have to call, divided by the size of the pot if you call. For example, if your opponent bets t100 into a pot of t200, the bet to call is t100, and the pot size if you call is t400. So, your pot odds are 100/400, or 25%. Another way of saying this is that you're getting 3-1, which represents the 300 already in the pot against the 100 you have to call. Over time, if you win the t300 that was out there 1/4 of the time, and lose an extra $100 3/4 of the time, you will break even. (.25)(+300) + (.75)(-100) = .75 - .75 = 0EV.

Potsized bets are laying you 2-1, or 33% pot odds. A bet of t200 into t200 means that when you call, there will be t600 in the pot, and 200/600 simplifies to 1/3 or 33%.

If your opponent bets a quarter of the pot, like t50 into t200, the pot will be t300 if you call, and 50/300 simplifies to 1/6, or 17%.

Here's an easy trick: Most of the time in game, you do not really have to do any math - just estimate based on the probabilities you already know - potsized bets are 33%, half pot bets are 25%, and quarter pot bets are 17%. Just pick where it seems to be in between, and you won't have to bring up a calculator when you are trying to figure out how often you need to be good.



As an aside, do not get confused when you are facing a raise, and not just a bet. If you bet t100 into a pot of t200, and your opponent raises to t300, you just have to look two places: Down, at how much you have to call (t200 more), and then add that number to what's displayed as the pot size (It will say 600, which makes it 800 if you decide to call). 200/800 is 25%. The general formula remains the same: How much you have to call, divided by the total pot if you call.

### *Quick Check Problems:*

1. Your opponent bets t275 into a pot of t450 on the river. What percent of the time do you need to have the best hand for calling to have a better expectation than folding?

2. On the river, you block bet t150 into a pot of t400, and your opponent jams for t650 more (800 total). How often do you need to be good for calling to have better expectation than folding?

3. You are facing a bet of t366 into a pot of t427. Without using a calculator, estimate how often you need to be good for calling to have better expectation.

*Calculating how often your opponent needs to fold for a river bluff to be +EV:*

If you assume you have zero equity when you are called, and have no chance at winning the pot if you do not bet, this one is pretty simple to calculate. Just take your bet size, and divide it by how much will be in the middle once you make your bluff. For example, if the pot is t300, and you want to bet t200, you need a fold 200/500 of the time, or 40%. A potsized bluff needs to work 50% of the time, and a half pot bluff needs to work 33% of the time – those are good landmarks to use so that you do not have to do much math in-game.

If you are considering a bluff raise, the equation is the same - how much money you are putting into the pot instead of folding, divided by that quantity plus whatever was in the pot that you are trying to steal. So if the pot on the river was t300, your opponent bets t150, and you want to try a raise to t450, you need a fold 450/(450 + 450) of the time, or 50%. You are risking t450 to get that t450 out there – it needs to work half the time.

What complicates this calculation is that in many situations, your expectation from checking and deciding not to bluff, is not zero, as we assume here. Sometimes you decide not to bluff with queen high and end up having the best hand against a missed draw. When this is true, you need a higher percentage of folds for bluffing to be better than giving up.

*Quick Check Problems:*

4. On the river, you know you have no showdown value. The pot is t320. How often does a t180 bluff need to work for it to have better expectation than checking behind?

5. Your opponent blockbets t100 into a t500 pot. You have t900 behind. How often does a jam have to work to be better than folding if you have no showdown value?

6. In this article, I say that your opponent having missed draws in his range means that you need to get a bigger percentage of folds when you have marginal showdown value in order for a bluff to be good. However, when your opponent has a missed draw, bluffing and checking behind have exactly the same result - you win - so it doesn't matter what you do against those hands. So why does it matter if our opponent has them in his range when we're deciding whether to bluff? Isn't this a contradiction?

***Answers to Quick Check Problems:***

1. 27.5%
2. 32.5%
3. Anywhere above 25% and below 33% seems reasonable to me, bonus points if you said 30%!
4. 180/500 = 36% of the time.
5. 900/1500 = 67% of the time.
6. If all our opponent is folding is hands we beat, it's clearly better just to give up. So it matters, don't be silly (or some variation of the argument that if we still win sometimes by checking, we need to do better than a 0EV bluff).

# Timing Tells in HUSNGs

In many of these articles, I have argued that most players spend too much of their study time contemplating the "sexy" aspects of poker, the complicated lines in unusual spots and the sick soulread tells that only true masters can spot, and not enough time on the basics. However, that does not mean that some of these more cool aspects of HUSNG are completely unworthy of studying. Understanding timing tells is a good example of a concept that will not turn you into a winning player from a losing player, but incorporating them into your game can absolutely improve your winrate.

When talking about timing tells, it is important to start by understanding that these tells happen for a reason. Timing tells are not about some mystical list of situations to memorize – you get information because of what the time of the decision suggests about how long they needed to think, and what your opponent wants to represent about the strength of his hand. From that framework, we can come up with some general rules about common tendencies that you can use to identify opportunities throughout your games.

## *1. Quicker calls generally indicate weaker hands that are not considering raising or folding, and are not trapping.*

There are two main aspects to talk about regarding this tell. First of all, the basic live poker tell of "strong is weak, weak is strong" applies here. Correctly or incorrectly, most players believe that waiting to call with marginal hands makes it seem like they were considering folding, and will cause opponents to put more pressure on them in future streets. Thus, with those mediocre hands, they often call more quickly, as if to say "do not try to bluff me on future streets, I have a hand that does not need to think twice about calling". With trapping hands, most players will Hollywood for at least a few seconds before calling, even online, as if to act like they were considering folding.


The second aspect of this tell is that when people have strong hands they might consider raising with, they will typically do just that – consider raising. On a K74 flop, then, a quick check/call is much more likely to be a 7x or 4x type hand than a K8 type holding, which has to pause and consider raising. In a 3-bet pot, when your opponent calls a c-bet on a Q95cc flop somewhat quickly, it means they did not consider raising, which makes Qx much less likely. In this scenario, 9x tends to be the most likely holding that you are up against.

## *2. When your opponent makes an aggressive move quickly, it means they did not need to think in order to make it.*

After calling a continuation bet on a K85cc flop and a 4c turn being checked through, your opponent quickly openjams the river, a non-club ace. While your opponent's range is fairly wide up until the quick river shove, that play quickly narrows his range down to rivered flushes, especially if your opponent is a recreational player. Your opponent needed no time to decide whether going all-in was a significant error. Again, there is a reason for this tell – without a hand, people need to think about the river card and whether it's a good idea to make a bluff, at least for a couple of seconds before they decide to spew off their stack hastily. It can sometimes be a spazzy move from an opponent who missed a draw, but when there are little to no missed draws in our opponent's range, these spots become very easy folds.

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Many opponents, for example, will give up way too much information in their timing from 3-bet jamming, snap-shoving Ax/pocket pair type hands that are easy, sure to be +EV jams, and taking some time to think about it before getting it in with more marginal hands that need fold equity to be good. I have also played against opponents who will do the opposite, and always pretend to think with their value hands but want to advertise that they had an easy decision with their bluffs, but this is more unusual. Regardless, once we identify either tendency, it becomes a tell, and we can make money off of it.

## *3. When your opponent takes his time before making a significant bet in a spot where you are likely to have a bluffcatcher, it means they are generally stronger.*

Put yourself in your opponent's shoes. You are on the river with a busted draw, trying to figure out whether or not to try to bluff – the only way you can win the hand. How often do you use a significant portion of the timebank and then decide to pull the trigger? For most people, the answer is "not often".

That is because in the mind of most players at that moment, the longer you wait to put the bet in, the more information your opponent will have about you. He will know that you did not have an easy decision about whether to bet. He will see through the computer screen and know just how badly you are already hoping for a fold. He will snap and you will feel like an idiot. The check button is so big and pretty – why not just give up, and live to fight another day?

Is this reasoning true? Are people more likely to call if you have to time down before deciding to make your bluff? I think probably not. Regardless, it is a tendency we can take advantage of.

In summary, generic timing tells come from one of two things:

a) How much he has to think about decisions.
b) How much he wants you to think that he has to think about decisions.

This might seem like a somewhat frustrating, perhaps even contradictory explanation. How do we know when our opponent is making his timing based on how much he actually had to think, and how do we know when the timing is meant to be deceptive? As tough as that question might seem, there are clear examples of each. Regardless of how easy the decision to continue with a trapping hand is, most players will Hollywood with it for at least a few seconds. Here, the tell is all about letter B. A quick continuation bet on a J98hhx flop is all about letter A, not B: Most opponents do not even think about their timing here, and would have to think with their weaker hands, but have an easier decision with their stronger hands. Some tells are also a combination: The quick c/c on the flop with middle pair, mediocre kicker, is both that your opponent did not have to think about his decision (check/call is obvious), and that he wants you to think he had an easy call (don't barrel me, please!). Working through your opponent's mind takes practice, but this framework should help you start to make more of those sexy soulreads on the river, as well as play more fundamental situations with that added level of expertise.

# Chapter 4: The Broader Game

## *Common Reasons Winning Poker Players Become Unprofitable*

*The final section of this ebook will widen back out to talk about the broader game of how to be a successful poker player, and more importantly, make poker a healthy part of the rest of your life. Just as we can look at the expectation of micro level decisions in poker, so too can we use some of those same techniques to think about how to approach the game on a macro level.*

Becoming unprofitable is the direct result of an inability to maintain focus on good thinking about expectation. To describe different aspects of what I mean, here are some stories. For almost all of these, I have real players in mind, but gave them cheesier screennames. It is of course possible to fall victim to aspects from any of these descriptions. As you read, think about what in each of these stories sounds like you.

*"BayesGetsBabes"* rose up quickly through the HUSNG world, starting at the 20s and then playing the 500s within a year. As he moved up, he soaked in knowledge from everyone around him, assuming that his game required a lot of work to get where he needed to be. However, once he got to his peak, he desperately wanted to feel like he had "arrived" in poker, and was entitled by the skills he had developed to keep winning. As you might expect, this caused him to stop improving, but something else happened, too. More and more frequently, in-game, BayesGetsBabes would make decisions impulsively, not based on expectation. He'd start seeing pocket threes 40bb deep and occasionally think "I'm going to make a potsized 3-bet this time". The old BGB would have stopped himself and decided "no, that has worse expectation, I have no reads to do that". The new BGB assumes that because the play came to mind, and because he's a creative enough player to well after it (and has made six figures lifetime playing poker), that the play must be okay to make. Suddenly BGB is check/raising flops against infrequent c-bettors, barreling off against calling stations, and losing gobs of value from senseless attempts to trap. With a much lower ROI, BGB tries to play more tables to get his hourly rate back, but that only leads to even less thinking about decisions with expectation in mind and even more whim-based play. After a while, it's been thousands of games, and BayesGetsBabes is no longer making money.

After reading the Table of Contents for this ebook, *"the50percentclub"* was perhaps most looking forward to this particular article. That's because the thought of becoming unprofitable is the one of the most crushing thoughts in the world to her. Despite the fact that her graph for the most part only goes straight up, the50percentclub finds it extraordinarily difficult to take risks. She plays most of her games against recreational players, frequently checking her EV line, highly concerned about whether the games will stay good. Even though the50percentclub lives a fairly low variance poker life, whenever she has a 15 buy-in downswing, she is absolutely crushed, waking up the next morning feeling utter contempt for the putrid aftertaste in her mouth from last night's losses. Eventually, after one of these bad runs, she will look around at the HUSNG landscape, with more and more players moving to hyperturbos while she gets less and less of a share of the recreational players, and decide to play less and less poker. It will have been a good career – the50percentclub will always be able to say that she made tens of thousands of dollars playing poker on the internet.

*"DeweyDfeatsWiki"* came up the way most players do, earning a healthy winrate from recreational players. However, after establishing himself at the 200s, he started to get into some entanglements with other regular opponents, as he was never afraid to be combative and start a duel with a player he did not like. However, after a while, poker became much more about those duels to him than it was about making money – he had developed a fairly passionate dislike for certain players and would almost always sit them whenever he saw them in the lobby. Eventually, he ran into one of those players who was significantly better than him, but his ego did not allow himself to let go of trivial internet disputes and focus on expectation. After a few occasions chasing losses at higher stakes and developing new enemies there, DeweyDfeatsWiki had blown through most of his bankroll.

After turning professional a few months ago, *"MeitnerWasRobbd"* just isn't feeling it anymore. He wakes up every morning, has a bowl of cereal, and turns on the poker client, registering for the same lobbies as he has done every day for the past month. Grinding is not a hobby anymore, but rather a job, and being up five buy-ins for the day now just feels like breaking even, and breaking even feels like losing five buy-ins. And losing five buy-ins? That just means he has to work both Saturday and Sunday to keep pace. Every day, it feels like him against the world, silently clicking the same buttons over and over again, wondering if he is killing his body because humans are not evolutionarily designed to sit in a chair for this much of life. Once in a while he tries to do things to spice the poker experience up, playing some larger tournaments here and there, messing around with regular speeds, turbos, and superturbos, even starting a coaching business, but nothing really works. MWR's volume dwindles and eventually he decides just to go back to his old job.

There are more types of stories, In fact, I had planned to write one about a poker player at Sapphire in Vegas, struggling to keep up with the demands of being such a baller all the time, but at press time, I have nothing worthy of a screenname. What each has in common is a way that players lose sight of expectation, either by being too risk-averse or too risk-seeking, by isolating away from any sense of community or getting too caught up in it, by making suboptimal plays out of an egotistical lack of discipline or being stubbornly opposed to altering strategies.

Not everything you do as a poker player has to be about your expectation in terms of money – ultimately, what you're probably trying to do is maximize is your expected utility in life, and those two concepts are not always correlated. Still, it is best to recognize that just as deciding whether to go all-in or just call with a flush draw are two decisions with two different expectations, so too are broader poker choices, like deciding which games to play and how many, picking which poker education resource to invest in or none at all, and figuring out whether it is beneficial for your long term poker development to go after an odious competitor, or let it go. These questions are sometimes very difficult to answer, but sometimes all it takes is an awareness of the problem we are actually trying to solve.

*"Not everything you do as a poker player has to be about your expectation in terms of money"*

There is one story I did not tell, and it is one that people often like to tell the most: Johnny was a winning player, but the games got tougher and now no matter how hard Johnny tries, he can't keep up with how much the games are improving. The omission was intentional – while games do get more difficult over time, pretty much everybody who was able to become a winning player in the first place has the ability to keep up with the gradual evolution of poker. The more you keep your focus on expectation and on getting better and not on seeing yourself as an established player who does not need to improve, the more likely you will be to avoid the common reasons winning players become unprofitable.

# Preventing and Mitigating Tilt

*The reason why tilt is so dangerous is because it causes you to lose focus on expectation. Chasing losses in bad situations frequently due to a loss of control is certainly another precursor to the downfall of profitable players.*

There are plenty of people who have their own theories on how to prevent tilt and stop it from hurting too much when it inevitably happens, and each will resonate more for different types of people. Some coaches take a more hard-lined approach and demand that you develop the ability to stop whining and stop getting upset over negative events, and learn how to act professionally. They describe tilt as childish and unattractive, hoping to strip people of the notion that bemoaning your bad luck is part of what being a poker player is all about. Other coaches approach tilt as more of a natural aspect of the poker player's condition, and argue that the most important skills to develop are those that help you walk away when you realize you have lost too much focus to keep playing, before any serious damage occurs.

Both perspectives are valid and useful. Serious poker players do need to internalize that there are decisions involved in getting tilted and that you can train yourself to be steadier. Teaching them to see those who tilt much more negatively is a slick psychological trick that helps to accomplish that. It is also inevitable that some amount of tilt and emotional play will still occur, and learning productive steps to take when it does is very important, too. Which of these frameworks you should think about more to attack your own issues with tilt depends on who you are and the intricacies of what makes your mind tick.

My thoughts on tilt tend to be much more general, and begin with what it is in the first place. Yes, tilt is that negative emotionality we feel when something does not go our way, but things don't go our way all the time in life and we don't go berserk about it. For most competitive poker players, when we lose a close game of ping pong to a friend we don't like to lose to, we're pissed – but our performance in the rematch is going to be better, even more focused, even more motivated to play well. I have experienced that same feeling in poker after a losing start to the day, a fierce determination that led to a long session of extremely good play, even as things continued to go against me. After one of those days, I'd proudly thump my chest after earning four dollars total instead of losing the five figures I was "supposed" to from the bad run of the cards. Or, maybe I would book a loss, but still shrug my shoulders, forget about work, and meet up with some friends for ice cream – how can you be upset when there's ice cream? That said, I have also experienced real tilt in poker, that eyes-bleeding, don't even see what buttons I'm clicking anymore, all-consuming rage. So what gives? When do we feel that productive, motivating determination when things don't go well, and when do we lose it and stop answering phone calls for 48 hours while drinking copious quantities of expensive whiskey, or whatever our preferred destructive behaviors may be?

As I progressed in poker, I got better and better at managing tilt, so much so that people would start joking that I was a robot, grinding out hundreds of high-variance, high-stakes games a day, experiencing significant intra-day swings, without much of an apparent effect on my play. I think I just got much better at understanding where those harsher feelings of tilt come from. The things that get to us so much that they have major performance detracting effect, rather than a motivating, performance enhancing effect, hit us really hard somewhere more significant to us. For a variety of potential reasons, they attack us on a personal level. In order to really mitigate the effects of tilt and prevent it from happening in the first place, you have to be conscious of where those awful feelings really come from.

Most often, the core of tilt is fear. It's fear that you will no longer be a profitable poker player. It's fear that you won't realize the expectation you've worked so hard to earn. It's fear that people will see this absolute moron at your stakes as a better player than you without knowing that he's run hotter than the sun in your games together. It's the fear that you won't get to the places you wanted so badly for poker to take you. It can be fear on a highly personal level: Whatever you are most afraid of in life, it will come out during a horrific session of bad luck. Oh yes, that's right: Tilt is a boggart. *Riddikulus!*

I always found that the happier I was with my life, and the more I felt I had to be proud of outside of poker, the less upset the swings of poker made me, even as those swings got more intense in terms of dollars. When being a successful online poker player is a big part of your positive self-conception, it only makes sense that the bad times in poker feel that much worse. If your balance in life is so bad that being a successful online poker player is the only part of your positive self-conception, that's when things start to feel really desperate.

OK, you get it – the rest of your life has an effect on how much you tilt. But just like in the rest of this ebook, really focus on how you would apply this and make an adjustment that makes a measurable difference. I do think that understanding the real core of where your tilt is coming from is half the battle, and that consciousness of your own emotions makes controlling them and using them to accomplish what you want to accomplish significantly easier. Fittingly, the last article will discuss how to broaden that expectation-driven approach to decision making even further and talk about that balancing act of poker in the rest of your life.

## *Poker in the Context of the Rest of Your Life*

*On many levels, poker is an inherently disconnecting game* – to play your best over long stretches of time, you have to immerse yourself into a world that few people on the outside understand, which by extension makes few people on the outside understand your life. There is certainly a danger in generalizing my experiences and those of my poker friends and claiming that everybody is like the people I know, but I think it is fair to say that there is a good chance making poker as a significant part of your life has had at least some negative effects. Poker also naturally has a lot of positive effects, too – presumably, we wouldn't be doing it otherwise.

Students really seem to enjoy the cautionary tales of the poker dweeb and the poker bro, so let's go back to them here at the end of the ebook. The dweeb often has a hard time making the transition between the expected value calculations of poker and the expected utility calculations of life, where amusingly, sometimes the course of action with the best utility is one that requires not making a utility calculation first. The bro has less trouble immersing himself in all the world has to offer, but often has a much tougher time sniffing out what he's looking for over the stench of his own artificiality. And if you're thinking "wow, that sounds bitter, you must lean to the dweeb side" – ok, sure, you're probably right. Which reminds me of another point: You'll find you are much more confident when you are willing to be comfortable with your faults and able to laugh and make fun of them yourself.

My biggest piece of advice when it comes to fitting poker in the rest of your life is simply to figure out what you really care about. Utility optimizing, whether attempted through precise calculation or vague intuition, gets much easier when you figure out what genuinely matters to you. Keep in touch with that, be confident in it, and let any haters hate.

Consciously be aware of how even small poker decisions can have an effect on your life. One specific thing I always advise against is playing poker in bed – seemingly a pretty minor consideration, but doing so can make it much more difficult to separate work from the rest of your life. The bed is for sleeping, reading, and any other ultimately relaxing activities you can think of – when you cause the brain to see it as a place where high complexity, high risk calculations take place, while constantly feeling the electronically generated heat of your laptop, you blur two aspects of your life that are not meant to be blurred. Every time you turn down going out with friends because you want to keep grinding, realize that the brain is pretty bad at making these types of calculations with a broader focus in mind. Awareness of self and of often unconscious decisions helps you make them a lot more effectively.

However, to finish this ebook, let's set the emotional talk aside and end on something fun. One of my favorite things about poker goes in contrast with what some people believe: If you do it right, becoming more and more advanced in poker thinking will also dramatically improve the way you approach life. Poker is great for you in so many ways. It teaches you how to think scientifically and skeptically about the world and how to really know when something is true. It teaches you how to go after something that you want and work harder than someone else for it. It very directly shows you how you can turn talent and diligence into more and more positive results. Poker teaches you about the power of information and the value of keeping your ego in check to learn from people. It teaches you the situational value of both swagger and humility. It forces you to learn that not taking risks in the short run is often highly risky in the long run. It shows you how immersing yourself into a community can be so much more effective than going at a problem alone, yet gives you the self-reliance to do so when you're stuck in a tough situation with a lot on the line. Worth googling for more about this is "Poker is Good For You", an article by David Sklansky and Allan Schoonmaker. Done right, poker is a tremendous benefit to the rest of your life in a much more meaningful way than simply how much money you make from it, or even the pure enjoyment you get from it.

Going forward in poker, always keep in mind the interaction between poker and your broader life. Use the themes talked about throughout this ebook, like the emphasis on what matters, the process of thinking about new information, the focus on optimal decisions rather than an easy, static strategy, and the willingness to accept new ideas that change your perspective about how to approach problems. Continually expanding on that foundation will serve you well in poker and in whatever else you decide to do with your life.

# WHY IS THIS FREE?

We've decided to make this book free for two primary reasons. First, we believe that exciting content with a low-no barrier to access is a great way to showcase not only what HUSNG.com has to offer, but what the game of heads up sit and go poker has to offer. We hope that many players not currently playing heads up sngs will find this book and that it will inspire them to give heads up poker a shot. Second, we want feedback, reviews, criticism and discussion about the book (and its impact), whether positive or negative.

Above all else, we believe that what has allowed heads up sit and go poker to survive, even flourish over the years, has been the fundamental quality of the game. We believe that sitting down and facing one single opponent at a time inspires a higher level of engagement from the average player which results in a higher level of entertainment. We believe that these are the qualities that have allowed so many new players of all levels, from so many parts of the world, to call heads up sit and go poker their primary game.

We would also like to thank a list of people for helping make HUSNG.com what it has become today. These people and groups have led to some of the most positive and influential experiences HUSNG.com has had to date.

Mat Sklansky, Mason Malmuth and Kiera from twoplustwo.com
Tony Guerrero, formerly of PokerAffiliateSolutions
Gregor Wright
Michael Sheehy
Pokeroff.ru
Pokerman.cz
maxv2poker.com

- Ryan P and Ryan D of HUSNG.com

*Below is a list of my recommended videos on HUSNG.com. You can find these videos in the Premium Membership.*

Mersenneary Video 1 - End Game Strategy

There are better, more advanced strategical videos as my game has developed, but my first video here continues to be one of the best reviewed on the site. It set of a firestorm of controversy: spamz0r refused to talk late game strategy with me for a month or two, and PrimordialAA (an idol at the time, and still, really) was furious, telling me that the video was too good to put out. That's how I really started to know that I knew what I was talking about.

I'd change some strategy decisions in this vid (we can talk about what), but the fundamental strategy is still a very good one and one I use every day against the right opponents: If your villian is 3bet shoving a wide range, use a polarized (big hands and junk) raising range and a limping range of middling hands that flop well and can deal with getting 3x raised. If your opponent doesn't adjust, he jams way too wide over your opening range that now has a much higher percentage of monster hands.

Mersenneary Video 6 - Advanced End Game Play: The Small Blind

A powerpoint presentation entitled "From NASH to ROFL" (sometimes minraising, sometimes openshoving, sometimes folding, sometimes limping), I argue that most of my small blind success has come from deviating from NASH and maximally exploiting my opponent's tendencies. I talk about which hands are best to put in which range, how to adjust against different player types, and theory behind why NASH, an equilibrium for perfect players with perfect information who aren't allowed to limp or minraise, is useful to know but a poor strategy to blindly employ.

Mersenneary Video 9 - Turbos against Fish

Let's face it: Most of your games are going to be against fish. You shouldn't really spend most of your studying time learning how to 4bet bluff the flop against Isuldur1. In this video, I talk about my balanced-yet-exploitative 3betting range (bigger with bluffs that don't flop as well/big AK/AQ/TT/99/88 type hands that are calling off a jam, smaller with big pairs/weaker stuff that flops well) and how just playing "ABC" isn't going to win you the most money against these players.

Mersenneary Video 11 - Compilation Video of Key Points

For this video, I do something a little different, collecting 10 hands against different opponents (some against the best players, some against worse players) and go through a list of 10 concepts I think it's really important for developing players to learn. Triple barrel bluffing, leading turns OOP for value, and a host of other topics are discussed in this unique format.

Mersenneary Video 17 - Advanced End Game Play: The Big Blind

The companion to Video 6, I use a PowerPoint talk about optimal end game play from the big blind. I start by talking about the value of 3bet shoving, but argue that far too often people compare the equity of a 3bet shove to the equity of folding, when really, we should be comparing against the equity of flat calling, in most cases. The most important thing to think about from the big blind is your opponent's opening frequency at different stack sizes - that determines a massive part of your decision making from the big blind. To get to the specific, I provide a chart that gives you a good sense of how deep to jam Ax hands over minraises at different stack depths and against different opening ranges. Some of the terminology in this video can get a little heavy: I introduce the concepts of what I call "f value" (the opening % necessary for 3bet jamming to be better than folding), and "h value" (the opening % necessary for 3bet jamming to lead to us having more chips than at the start of the hand, a useful benchmark when trying to calculate if flatting might be better), but I'm happy to answer any and all questions if you get confused.

Mersenneary Video 23 - An Introduction to Metrics

The first of a 3-part series detailing how I use my statistics to improve my play. Parts 2 and 3 can be found by searching my video history. A good introduction for those who are interested in the concept - but to be completely honest, if you're not a numbers guy, I'd focus on studying what you are interested in learning (although there is a cliffnotes in Part 2 and Part 3). These videos have gotten high reviews and are some of HokieGreg's favorites.

Mersenneary Video 24 - End Game Live Show

I'll be making more and more live commentary videos since this one got such a good reception. Here's me talking on-the-fly versus some fish and some very good players at high stakes superturbos. It's true that the game definitely opens up when you're playing against a thinking player - I talk about how and what adjustments are necessary.

Mersenneary Video 26 - Dominating Domsnuts at the $5600s

This video really helps to drive home the point that playing perfect poker isn't making pretty, unexploitable betsizes, but rather exploiting the hell out of whoever we're playing, no matter what the stakes are. Our opponent is a regular high stakes fish who likes the call button a little too much and doesn't 3bet jam very wide. We take that and run with it to a 9-5 victory over the series of 14 games. This video is footage from near the end of duel after I really had established good reads and put them to use at the highest stakes FTP has to offer.

Mersenneary Video 28 - Heads Up SNG Statistical Analysis Video Series: Part 3
The final chapter of my Statistical Analysis Series, I talk about using software to evaluate gameplay decisions. I talk about why stabbing OOP in limped pots can be printing money and other observations about general play. I also talk about my own leaks and added a cliffnotes page at the end of the video.

Mersenneary Reviews Your Heads Up SNG Poker Hands
This is actually a standard membership video, so if anybody wants a taste of what my videos offer and wants to opt for the 300+ $25 standard package, you'll find this video within that package. In this video I basically outline basic strategy demonstrated in a review of 2 months or so of HUSNG.com forum threads. I focus on hand strength and relative hand strength differences and common errors made by low and mid stakes players.

Mersenneary Plays Turbo Speed and Super Turbo Speed Heads Up SNGs
In this video I two table turbos and super turbos against a variety of opponents, including ZeeJustin. I talk about bet sizing changes, ranges and the correct adjustments against opponent with infrequent preflop aggression from the big blind and a wide calling range.

Mersenneary High Stakes (Super) Turbo Mix
I play Brandon Adams at the $1000 Super Turbo buyin in this video, among other opponents at that level as well as the $550 level. I discuss bet sizing and perceived ranges, adjusting to passive opponents OOP and I discuss using a HUD. I also confuse an opponent by bet/calling an all in with J5 on a 664 flop.

Mersenneary Plays Two Heads Up Poker Professionals and One Tournament Professional
I face off against Chris Moneymaker, HUSNG.com coach Croixdawg and Melanie Weisner in this video. Small flop sizings to setup bluffs, why Money's last play was an error and c-bet sizing on dry boards in 3bet pots are just a few of the topics discussed in this video.

Mersenneary's Coaching Desk: Xereles (Part 1)
I review the first half of footage from "Xereles", a $200-$500 regular. I talk about turn sizings with thin value bet hands, and finish with a statistical discussion of when to limp, when to minraise/fold, and when to openshove with marginal hands 10-15bb deep.

Mersenneary's FastTrack Special
In this video, I give premium subscribers a peek into the critically acclaimed FastTrack coaching program with a video of excepts from a group coaching session for endgame play. Specifically, I talk about 20bb play from the small blind when trying to decide whether to raise/call or raise/fold. To do this, I show tables of expectation for different hands when readless and when playing against nittier or more aggressive opponents. Holding nothing back, I even give a table showing an optimal calling range against my own readless 3-bet shoving range. Implications are discussed.

Plugging Leaks at the Source and Planting Seeds, A Mersenneary Video
I give a two part powerpoint presentation. The first part focuses on how preflop frequencies affect far more postflop decisions than most players are aware of, a common source of postflop leaks. The second half talks about how and why to even watch powerpoint videos, discussing the main ways in which players fail to use theory to increase their results, and the prevalence of two undesirable characters in the gambling world - the "poker dweeb", and the "poker bro".

Mersenneary's Coaching Desk: Xereles (Part 2)
I give my thoughts on a coaching session with Xereles, a midstakes regular, starting with an interesting first hand against H2Olga. Throughout the session I talk about 3betting both for value and for bluff and optimal lines with marginal holdings OOP.

Mersenneary Poker Life Coaching
I made this video as my first mental game coaching video based on the insights of his friends and WSOP house members. I talk about what keeps people from playing their best poker over time and give specific recommendations for those who feel this aspect of their game could use improvement.

High Stakes Territory Wars Part 1 (livb112)
I review a series of three games played against livb112 at the $330, $550, and $1100 level, when the greatest husng player of all time declared in chat "we are going to test to see if u are actually decent" (spoiler alert: livb is not impressed). In it, I talk about correct adjustments against a player with wide preflop hand selection and frequent postflop aggression, identifying some strategies livb is using that we can learn from (like c-betting unusual sizes that are actually optimal), and I point out that even the G.O.A.T. can make some fundamental errors after getting caught bluffing.

High Stakes Territory Wars Part 2 (livb112)
I complete a two part series against the HUSNG G.O.A.T. with some $1000 and $500 superturbos, and a $720 4-man. I focus on perceived range, getting value by taking the line that represents the most air, playing an appropriately wide range out of position, and reacting to aggressive postflop tendencies. Along the way, I continue to point out things to learn from livb's play and the technical errors that result likely from the legend not particularly caring about midstakes.

High Stakes Territory Wars Part 3 (Retro Spamz)
I play the great Mientjeuh (aka spamz0r) back in 2009, which leads to horrifying realizations about just how bad my old self used to be. I talk about my own errors, what to learn from spamz's play, and how to break out from the mold of your current level. Varying c-bet sizes and perceived range/actual range are discussed.

High Stakes Territory Wars Part 4 (H2Olga)
In this video, I dissect 41 hands of pure pain against H2Olga, in games where one of the best players in the game clearly got the better of me. I talk about reacting to people who 3bet wide and call wide OOP, minraise wide and play aggressively postflop, and why despite that information I still got owned so badly. Missed barreling opportunities, missed 3bet jams, poorly thought out hero calls, and incoherent bluffing lines characterize my play, but I explain the fundamentals behind the creative non-standard plays H2Olga makes in response to my ranges. My next two videos are also against H2Olga (Parts 5 and 6 of the series).

Mersenneary at the High Stakes
I play a $2200 turbo against CompleteDonk. I talk about what opponent characteristics make limping with medium-strength holdings much worse than minraising, about broader adaptations when you see people don't thin value bet and also like to trap with their big hands, and I reveal a big tell of my own.

Mersenneary vs The Reds
I take out my own frustration about his FTP funds in limbo with a series of hands against red pros: Phil Gordon, Mike Matusow, Barny Boatman, David Pham, Brandon Adams, and Erica Schoenberg. I talk about how they butchered certain situations and his own errors from the older hands, suggesting how they might be instructive to current players at the $50-$100 levels.

Mersenneary "Special Edition" 6 Tabler
I review gameplay footage of a student 6-tabling super turbos on Lock Poker. I focus on correct and incorrect applications of the NASH charts, how wide to raise limps, the pitfalls of the go-and-go play, and how to float in position when you can get a lot of information about your opponent's range on the turn.

Mersenneary Hyper Turbo Review: Where The Money Is At
I review the second half of footage from a student's 1-tabling $100 hyperturbos. I talk about the difference between the sexy play and the play that makes you the most money, maintaining disciplined opening ranges, and openjamming vs. limping/minraising decisions 8-12bb deep.